REPORT RESUMES

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REVIEW, EXPANSION OF TRANSITIVE VERBS, DETERMINERS, MORE ABOUT QUESTIONS, AND THE NEGATIVE. LANGUAGE CURRICULUM III, STUDENT VERSION.

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VARIOUS FORMS OF PHRASE STRUCTURE RULES AND EXPANSION, AND THE SINGLE-BASE AND DOUBLE-BASE TRANSFORMATIONS WERE INCLUDED AS AN INTRODUCTION TO THIS GRAMMAR REVIEW GUIDE FOR NINTH-GRADERS. THE REVIEW COVERED INDIRECT OBJECT VERBS, TRANSITIVE VERBS, DETERMINERS, DEFINITE AND INDEFINITE ARTICLES, IMPERATIVES, NEGATIVES, AND CONTRACTIONS AND WAS BASED ON THE STRUCTURAL TECHNIQUES TAUGHT IN EARLIER COURSES. THE GUIDE INCLUDED WRITTEN EXERCISES AND EXPLANATIONS FOR ALL SECTIONS OF THE REVIEW. THE TEACHER VERSION IS ED 010 830. RELATED REPORTS ARE ED 010 129 THROUGH ED 010 160 AND ED 010 803 THROUGH ED 010 832. (FM)

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OREGON CURRICULUM STUDY CENTER

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EXPANSION of TRANSITIVE VERBS
DETERMINERS
MORE ABOUT QUESTIONS
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Language Curriculum III
Student Version

The project reported herein was supported through the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education, and Welfare.

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LANGUAGE III

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REVIEW UNIT FOR LANGUAGE III

This unit gives you the opportunity to check up on your understanding of the phrase structure rules and expansion, and the single-base and double-base transformations of Language I and II. Exercise 1 will help you identify weak spots in your background. Once such areas are pinpointed, you will find that the other exercises offer a review for your special need.

Exercise 1: Review and Diagnostic Test

Reduce the following sentences to their underlying symbol strings. Show how each sentence was produced.

Example: Sentence--When did the race begin?
NP + Tns + Vin + Tm

Kernel--The race began at noon.

Yes-or-no question
Tns + do + NP + Vin + Tm
Did the race begin at noon?

wh-attachment
Tns + do + NP + Vin + wh + Tm
Did the race begin when?

Tm-question
Wh + Tm + Tns + do + NP + Vin
When did the race begin?

A. 1. Sally wore a blue dress at the party last night.
2. The frightened child sobbed noisily.
3. That accident was caused by the landslide.
4. The football rolled into the street.
5. Mary's father became tired easily.
6. Who caught the pass?
7. How did you like the dessert?
8. We must scrub and wax the floors before dinner.
9. What are they dancing?
10. Bruce speaks softly but distinctly.

B. 1. Wind and rain cause erosion.
2. We dissected the frog which was sick.
3. Those chords sound discordant and harsh.
4. Where did you put the salt?
5. Mr. Edwards, the custodian, should replace the light.
6. The Mustang crashed through the barricade and into the ditch.
7. Miss Ormsley teaches math and science.

Did any of the sentences in Exercise 1 contain elements that you could not explain? Did you find any kind of sentence that you have not studied? Perhaps you need only to review some of the grammar that you studied last year, or you may have found some concepts that you have not studied at all. Your problems in doing this diagnostic exercise should direct you to the proper review exercises throughout this unit.

Review Exercise 2: Adverb of Place

If you had trouble identifying "at the party" in Sentence 1 (A), writing symbol strings for the sentences in Exercise 3, page 3, in Expansion of Phrase Structure Rules,* should help you.

Review Exercise 3: Adverb of Time

Did Sentences 1 and 8 (A) cause any problem? Exercise 3, (A), page 6, in Expansion of Phrase Structure Rules, should help you recall the adverb of time.

Review Exercise 4: Active and Static Linking Verbs

Difficulty with Sentences 5 (A) or 3 (B) may mean that you have forgotten some details about active and static linking verbs. Try Exercise 2, page 8, in Expansion of Phrase Structure Rules, for practice.

Review Exercise 5: Adverb of Direction

Sentences 4 (A), and 2 and 6 (B) contain adverbs of direction. Review Exercise 3 (A), page 10, in Expansion of Phrase Structure Rules, should be helpful to you here.

Review Exercise 6: Passive

Perhaps you have forgotten how to do a sentence like #3 (A). Exercise 1(B) on page 18, Expansion of Phrase Structure Rules, offers a good review for this kind of sentence.

Review Exercise 7: Yes or No Questions

What is the first step in forming any question? Sentences 6, 7, and 9 (A), and 4 (B) require this kind of transformation. To help you review this, do Review Exercise, page 28, in Single-Base Transformations.

Review Exercise 8: Replacement of Object

If you need to review sentences like 9 (A), Exercise 7, page 34, Single-Base Transformations, will aid you.

*All review exercises in this unit refer to the Expansion of Phrase Structure Rules and Single-Base Transformations and Double-Base Transformations Manuals in Language II.

Review Exercise 9: Other Question Replacements

Did you have trouble with the other questions, #7 in A, or #4 in B? Exercise 10, page 37, and Exercise 15 (A), page 42, Single-Base Transformations, should help you.

Review Exercise 10: Subject Replacement

If you have forgotten anything about questions like #6 in (A), try Exercise 16, page 49, Single-Base Transformations, as a reminder.

Review Exercise 11: All Question Transformations

Exercise for Review (B), pages 51-52, Single-Base Transformations, provides an excellent general review for all question transformations.

What kind of transformations produced Sentences 8 and 10 in (A), and 1, 3, 6, and 7 in (B)? How are they alike? In what ways do they differ? If you need to refresh your memory of conjunctive transformations, the following exercises will be helpful.

Review Exercise 12: Subject Conjunctions

For a better understanding of Sentence 1 in (B), do Exercise 3 (B), page 6-7, in Double-Base Transformations.

Review Exercise 13: Verb Conjunctions

To review sentences like #8 in (A), try Exercise 6 (B), pages 13-14, Double-Base Transformations.

Review Exercise 14: Conjunctions Formed with Other Parts of the VP

Did you have trouble doing Sentence 10 (A) or Sentences 3, 6, and 7 (B)? These double-base transformations contain conjunctions formed with other parts of the VP. What part of the VP form the conjunction in #10 (B)? What parts form the conjunctions in Sentences 3, 6, and 7 (B)? A review for these sentences may be found in Exercise 8, page 18; Exercise 9 (B), pages 19-20; and Exercise 10 (B), pages 20-21, Double-Base Transformations.

Which of the sentences in the Diagnostic Review Test contained embedded elements? Look again at the sentences you missed. Errors in Sentences 2 and 5 (A), or 2 and 5 (B) may indicate that you need more experience with embedding transformations.

Review Exercise 15: Embedding Transformations

Turn to these exercises in Double-Base Transformations for practice in embedding.

For Sentence 2 (A):
Exercise 2 (B), pages 23-24
Exercise 3 (B), pages 25-26
Exercise 4 (B), pages 27-28

For Sentence 2 (B):
Exercise 5, pages 29-30

For Sentence 5 (B):
Exercise 7, page 31

For Sentence 5 (A):
Exercise 2 (B), pages 36-37
Exercise 3 (B), pages 38-39
Exercise 5 (D), page 43

When you have completed your review, the following exercise will measure your competency in expansion of phrase structure rules, and in single-base and double-base transformations.

Exercise 16

Construct original sentences to illustrate each of the following:

A. 1. $S_1 + \underline{\text{and}} + S_2$

2. $\ldots \text{NP} + \left\{\begin{matrix}\text{whom or which}\\ \text{that}\end{matrix}\right\} + \text{NP}^s + \text{Aux} + \text{have} \ldots$

3. $\ldots \text{T} + \text{Adj} + \text{N} + \text{N}^o$

4. $\text{NP}_1 + \left\{\begin{matrix}\text{who or which}\\ \text{that}\end{matrix}\right\} + \text{Aux} + \text{Be} + \text{Pr} \ldots$

5. $\ldots \text{Tm}_1 \text{ and } + \text{Tm}_2$

6. $\ldots + \text{Vtr}_1 + \text{NP}^2 + \text{and} + \text{Vtr}_2 + \text{NP}^2$

7. $\ldots + \text{NP}_1^2 + \text{and} + \text{NP}_2^2$

8. $\ldots + \text{VP}_1 + \text{and} + \text{VP}_2$

9. $\text{NP}_1 + \text{and} + \text{NP}_2 + \text{rest of sentence}$

10. $\ldots \text{Dir}_1 \text{ and } + \text{Dir}_2$

B. 1. $\ldots \text{NP}^s + \text{s} + \text{N} + \text{N}^o \ldots$

2. $\text{NP}^2 + \text{Aux} + \text{be} + \text{en} + \text{Vtr} + \text{by} + \text{NP}^1$

3. $\text{wh-NP}^2 + \text{Tns} + \left\{\begin{matrix}\text{M}\\ \text{have}\\ \text{be}\\ \text{do}\end{matrix}\right\} + \text{NP}^1 \ldots$

4. $\text{wh-}NP^1 + \text{Tns} + \left\{\begin{matrix} \text{M} \\ \text{have} \\ \text{be} \\ \text{do} \end{matrix}\right\} + \ldots$

5. $\text{wh-Man} + \text{Tns} + \left\{\begin{matrix} \text{M} \\ \text{have} \\ \text{be} \\ \text{do} \end{matrix}\right\} + NP^1 \ldots$

Try to write symbol strings for the following. Some are the result of transformations.

1. The United States sent Pakistan planes.
2. The Basques moved the sheep to the mountains.
3. Mr. Williams sent the note home yesterday.
4. We will have the game at Sutter's Field.
5. The team cannot play against those odds.
6. Mr. Honiker gave his students a bad time.

Did you find any sentences which you could not do? Which ones contain elements that you could not explain? Do you see any similarity between Sentences 1 and 6? Which sentences seem to contain Loc? How did you classify the verbs in the sentences having a Loc? What two kinds of Loc are used after intransitive verbs? Are the Loc's in the sentences above all the same kind? What is different about Sentence 5? These questions, and many others, will be explored in your grammar units this year.

EXPANSION OF TRANSITIVE VERBS

THE INDIRECT OBJECT VERB

When you were working with the phrase structure rules you discovered that there are five major types of verbs. -- Be, linking verb, mid verb, intransitive verb, and transitive verb—and that each type has special characteristics. What are the characteristics of transitive verbs?

1. They are always followed by an NP. (Rule (10) says that a subset of V is Vtr + NP.)

   Example: Vtr + NP
   The puppy dug a hole.

2. They can become passive through the passive transformation.

   Example: The puppy dug a hole. ⟹
   A hole was dug by the puppy.

How does the transitive verb differ from a linking verb followed by an NP? How does it differ from the mid verb?

Exercise 1: Try to convert the following sentences to the passive form, and then decide which ones have transitive verbs.

1. The waiter served the food.
2. The fence is blocking our way.
3. The fire made shadows on the tent.
4. The dog was licking the dish.
5. No one has had time today.
6. The campaign was a success.
7. Polly will write a speech.
8. Robert gave the girl a bracelet.

Did you find any sentences which you could not transform to the passive? What kind of verbs did these sentences contain? Did you notice anything different about sentence #8? What? When you transformed sentence #8 to the passive did you have the following?

The girl was given a bracelet by Robert.

Or did you have this sentence?

A bracelet was given to the girl by Robert.

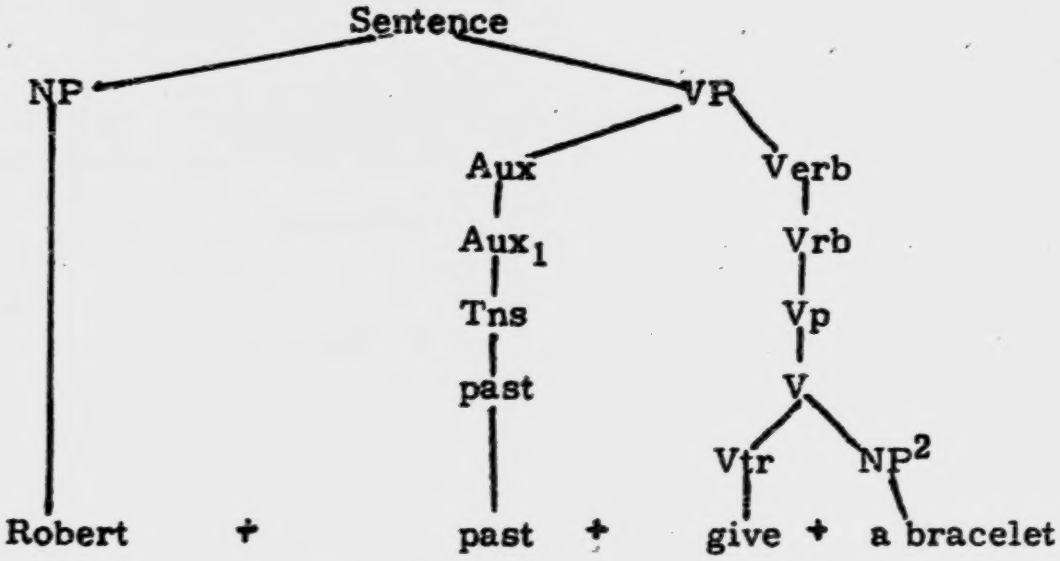
Either form is possible. The verb in this sentence is different from the other transitive verbs which we have looked at so far in being followed by two NP's, and in being capable of the two different passive transformations. Let us see if there are other transitive verbs which have this quality.

Exercise 2: Try to convert the following sentences into the passive form. Whenever possible convert in two ways and list the verbs from the sentences in which this is possible.

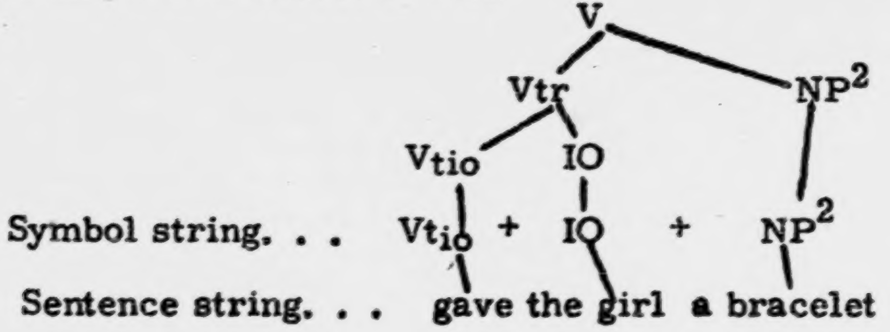
1. The superintendent awarded the team a trophy.
2. The halfback kicked the ball.
3. The company will send George a bonus.
4. Frannie bought her brother a book.
5. A workman is topping the tree.
6. The kids have shot firecrackers all week.
7. Teddy has clipped the grass in the front yard.
8. The university presented Linda a scholarship.
9. The clerk must have sold Tom a lemon.
10. The waiter made Jane a milkshake.

Verbs, such as those you have listed, are said to be verbs which take an indirect object, and the additional NP which enters the sentence with these verbs is called the Indirect Object.

We know how to make branching diagrams for sentences with Vtr + NP, but how will we diagram a sentence which has this second NP? If we try to diagram "Robert gave the girl a bracelet" (with the symbols we know already,) we can account for all parts of the sentence except one. We have no place for the girl.


Sentence
NP
VP
Aux
Verb
Aux₁
Vrb
Tns
Vp
past
V
Vtr
NP²
Robert + past + give + a bracelet

The diagram results in *Robert gave a bracelet which is ungrammatical because something is missing. Obviously we need to show that this special kind of transitive verb is followed not only by NP^2 (bracelet) but also by another NP (girl). We will call such verbs indirect object verbs and give them the symbol V_{tio}. The second NP which appears with this special kind of verb is called the indirect object, which we will symbolize as IO. In the branching diagram we will show that the indirect object verb and the indirect object branch off from Vtr because they are a subset of Vtr.


V
Vtr
NP²
Vtio
IO
Symbol string. . . Vtio + IO + NP²
Sentence string. . . gave the girl a bracelet

Rule (10)

We can now write a rule to show that Vtr includes, along with many other types of transitive verbs, this special class which is followed by an indirect object. Because this is only one kind of transitive verb we will use a bracket and (. . .) to show that there are other kinds. We will add some of the other kinds later. In Rule (10.1) we expanded the intransitive verb. Now we are expanding the transitive verb. This is the second expansion of Rule (10) and we will call it Rule (10.2).

Rule (10.2)

$$\boxed{Vtr \longrightarrow \begin{Bmatrix} Vt_{io} + IO \\ \ldots \end{Bmatrix}}$$

Now we will try to define more specifically what this Vt_{io} means. In the first sentence we talked about--Robert gave the girl a bracelet. --there is a word implied between gave and the girl.

Robert gave ______ the girl a bracelet.

If we state the sentence in another way the word actually occurs. What is it?

Robert gave a bracelet ________ the girl.

What words fit into the blanks in the following pairs? In which sentence of each pair does the word actually occur? In which sentence is it only implied?

1. The teacher might read ______ the class a story.
   The teacher might read a story ______ the class.

2. The boy must have left ______ the dog some food.
   The boy must have left some food ______ the dog.

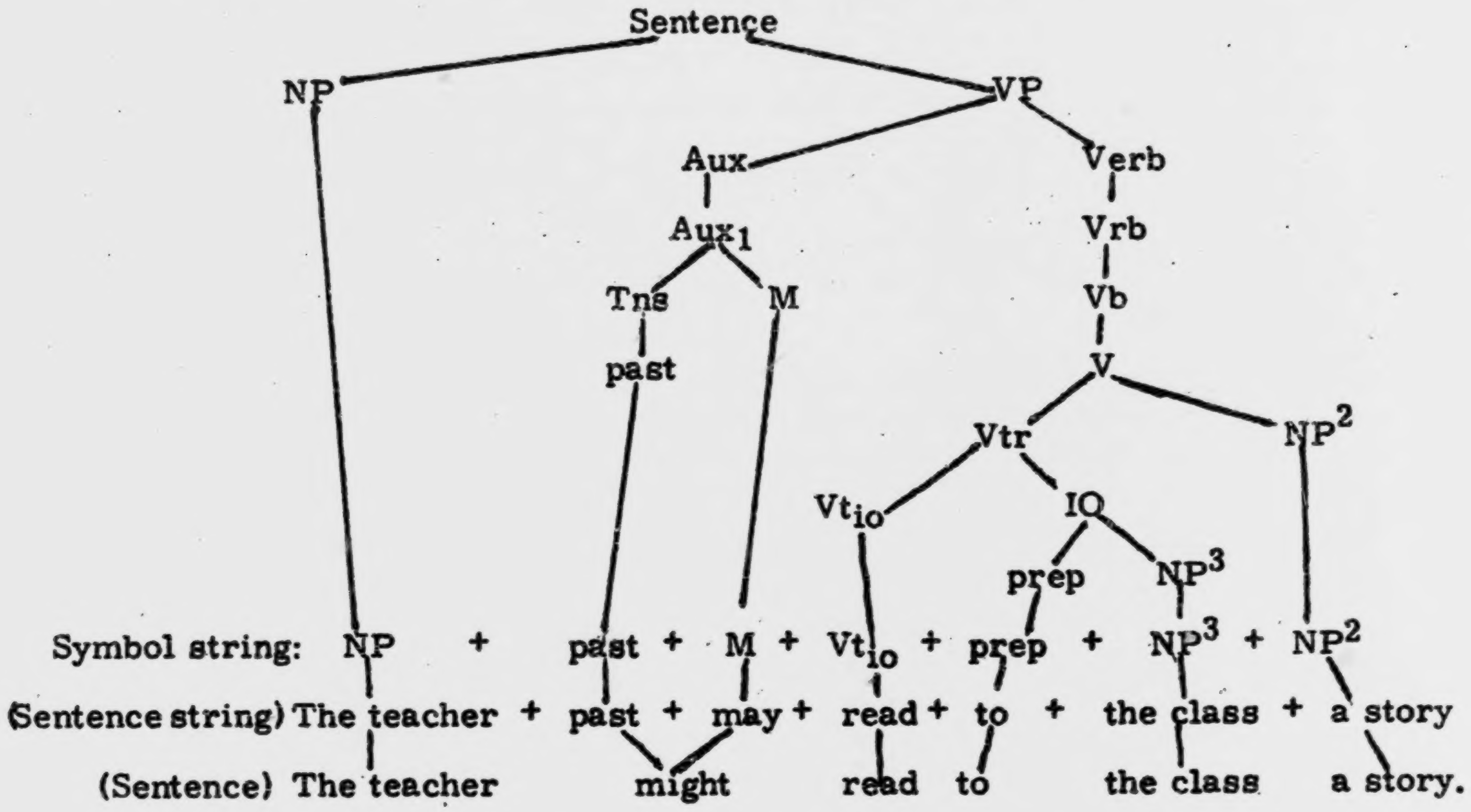
3. Hazell asked ______ the plumber a question.
   Hazell asked a question --- the plumber.

The word you have supplied in each sentence (to, for, or of) and the NP which immediately follows it should actually be looked on as part of this particular kind of transitive verb. Some indirect object verbs are accompanied by to, some by for, and some by of and all of them are followed by an indirect object NP, which we will call NP^3. Words like to, for, and of are called prepositions. We can say then that IO is made up of a preposition, which we can symbolize as prep, plus an NP. We can state this fact in a rule:

$$\boxed{IO \longrightarrow prep + NP^3}$$

Now let's diagram a sentence using our new rules.

The teacher might read the class a story.



Symbol string: NP + past + M + Vt_{io} + prep + NP^3 + NP^2

(Sentence string) The teacher + past + may + read + to + the class + a story

(Sentence) The teacher might read to the class a story.

Is the sentence which results from applying our new rule in this diagram a grammatical sentence? What could you do to make it grammatical? There are two possibilities.

1. We can delete the to and leave the rest as it is. (The teacher might read the class a story.)

or

2. We can move the to and the NP^3 to a position right after the object NP^2 (The teacher might read a story to the class)

We must do one or the other. A choice must be made if we are to produce a grammatical sentence. Now, you know that when we change the structure of a sentence produced by the phrase structure rules, we are performing a transformation. So when we make one of these two changes to produce a grammatical sentence we are performing an obligatory transformation. How shall we symbolize what happens in these transformations? The symbol string for any sentence with a Vt_{io} can be written

$$NP + Aux + Vt_{io} + prep + NP^3 + NP^2$$

We can make use of braces to indicate that the transformation to be performed on this string will be one kind or another. In other words we will use braces to show that we have a choice of transformations.

Tio $$\boxed{NP^1 + Aux + Vt_{io} + prep + NP^3 + NP^2 \Longrightarrow \left\{ \begin{array}{l} NP^1 + Aux + Vt_{io} + NP^3 + NP^2 \\ NP^1 + Aux + Vt_{io} + NP^2 + prep + NP^3 \end{array} \right\}}$$

Exercise 3:

A. Construct sentence diagrams for the kernel underlying each of the following sentences. Remember that when a Vt_{io} verb enters the diagram, it is accompanied by an Indirect Object which consists of a preposition plus an NP. In order to save space, do not develop the NP's. Just bring them down to the symbol string as NP's. See the example on p. 4.

1. The ambassador bought the interpreter a dictionary.
2. Mr. Goldwater offered the people a choice.
3. Mrs. Thomas has made the class a trophy.
4. The government will be selling Japan the minerals.
5. Indians have given the settlers instruction.
6. Walter has been asking the foreman questions.
7. The senator wrote Sandy a letter.
8. Politicians should tell people the truth.
9. Isabella gave Columbus the ships.
10. Hope gave them courage.

B. Transform the sentence strings in A to grammatical sentences by deleting the prep.

C. Transform the sentence strings in A by relocating the IO.

Exercise 4: Construct ten sentences which contain Vt_{io} verbs. What tests must such sentences pass?

Exercise 5: The following sentences are the results of transformations. For each one write the underlying string which was produced by the phrase structure rules.

Example: Joe gave Jim a black eye.

$$\begin{array}{ccccccccccc} NP & + & Aux & + & Vt_{io} & + & prep & + & NP^3 & + & NP^2 \\ | & & \searrow & & \swarrow & & | & & | & & | \\ \text{Joe} & & & \text{gave} & & & \text{to} & & \text{Jim} & & \text{a black eye.} \end{array}$$

1. Father brought some roses to Mother.
2. The swindler made Jim a proposition.
3. The officer asked Jeff some questions.
4. Frank built a playhouse for the children.
5. The cook baked the man a cake.

What we have learned:

1. A Vt_{io} is a kind of transitive verb followed by an indirect object. (IO)

2. The IO is made up of a preposition plus an NP.

3. The prepositions which occur in IO are either to, for, or of. For convenience we call the NP which follows the preposition in the IO, NP^3. This occurs in addition to the regular direct object NP which we called NP^2.

4. Because the IO object enters the sentence in front of the NP^2 a transformation must either delete the preposition or move the whole IO to a place after NP^3.

Example: The policeman gave to the boy a ticket. ⟹

The policeman gave the boy a ticket.

or

The policeman gave a ticket to the boy.

TRANSITIVE VERBS OF DIRECTION

Each of the major classes of verbs, except Be, can be broken down into smaller subdivisions. For instance, you know that there is a special class of intransitive verbs which take adverbs of direction,

Example: Vid Dir

The boy dived into the water.

In Rule (10. 1) we symbolized such verbs by Vid + Dir.

You have also learned that the transitive verb can be subdivided into smaller categories. For example, one small class of transitive verb is the indirect object verb. Breaking larger classes into smaller classes means that we are being more specific about the smaller classes. To say that give is an indirect object verb is more specific than to say simply that it is a transitive verb. It is more specific because indirect object verbs have some special qualities which do not apply to the general class of transitive verbs. What are the special qualities of an indirect object verb?

In this unit we will be interested in discovering whether there are other subclasses of transitive verbs.

Exercise 1. In the following sentences, find the indirect object verbs by applying the test for such verbs.

1. The coach gave the swimmer a demonstration.
2. The teacher sent the girl to the office.
3. Peter gave his sister a necklace.
4. Joe wrote Jim a letter.
5. The store gave the student credit.
6. The man built his mother a house.
7. The old lady asked the Scout a question.
8. Sally designed her mother a dress.
9. The policeman gave the old lady a ticket.
10. The children sent a present to the teacher.

Did you find any sentences which would not transform to the passive in two ways? What kind of verb is there in sentence #2? Is it an indirect object verb? How do you know? Does Sentence #10 contain an indirect object verb? How do you know? Sentence #2 and Sentence #10 look very much alike.

The teacher sent the girl to the office.
The children sent a present to the teacher.

But what happens when we try to transform them into passives? Number 10 transforms in two ways:

A present was sent to the teacher by the children.
The teacher was sent a present by the children.

Can #2 be transformed in two ways?

The girl was sent to the office by the teacher.
*The office was sent the girl by the teacher.

Obviously it is possible to transform this sentence into the passive in only one way. What, then, would you say is the difference between the verbs in sentences #2 and #10?

Try to recall the discussion of the intransitive verb class which takes adverbs of direction. These adverbs answer the question where, meaning "to what location". Adverbs of direction can be either one word or a phrase. They can be transformed to questions containing where plus to.

Example: The boys are hiking to Death Valley.
Where are the boys hiking to?

Now try to replace the intransitive verb hike in the sentence above with a transitive verb. Remember, the transitive verb is followed by an NP and it is able to undergo the passive transformation.

The boys sent the sheriff to Death Valley.
The boys drove the car to Death Valley.
The boys rode the horses to Death Valley.

Send, drive, and ride are all transitive verbs, and they can each be accompanied by the same directional adverb as the intransitive verb hike. They represent a small class of transitive verbs which occur with a direction adverb. Can you think of other examples? You probably have noticed that not all transitive verbs can occur with directional adverbs. This small subclass can be symbolized as $Vt_{dir} + Dir$. The t of course is your clue that this is a part of the class of transitive verbs. The dir is a clue to the fact that this is the class which occurs with the adverb of direction. And from your previous experience you know that Dir is the symbol for adverbs of direction. How can we include this new class in the rule which rewrites Vtr? We have already accounted for the indirect object verbs in this class. We will continue to use the symbol (. . .) to show that there are other kinds of transitive verbs which we haven't yet accounted for. So 10. 2 will now look like this:

Rule (10. 2)

$$\boxed{Vtr \longrightarrow \begin{Bmatrix} Vt_{io} + IO \\ Vt_{dir} + Dir \\ \ldots \end{Bmatrix}}$$

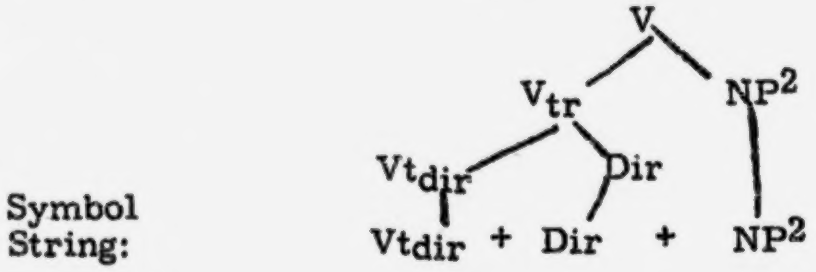
Exercise 2: Copy the following sentences and label the verbs as Vt_{io} (indirect object verbs); Vi_d (intransitive verb of direction) or Vt_{dir} (transitive verb of direction). Also label the indirect objects (IO) and the directional adverbs (Dir). Be able to explain your choice.

Example: The shortstop $\overset{Vt_{dir}}{\underline{\text{threw}}}$ the ball $\overset{Dir}{\underline{\text{to the pitcher}}}$.

1. The boy gave the apple to the teacher.
2. The hawk dived at the chicken.
3. The teacher sent the girl home.
4. Water has been trickling into the basement.
5. We drove the car into the garage.

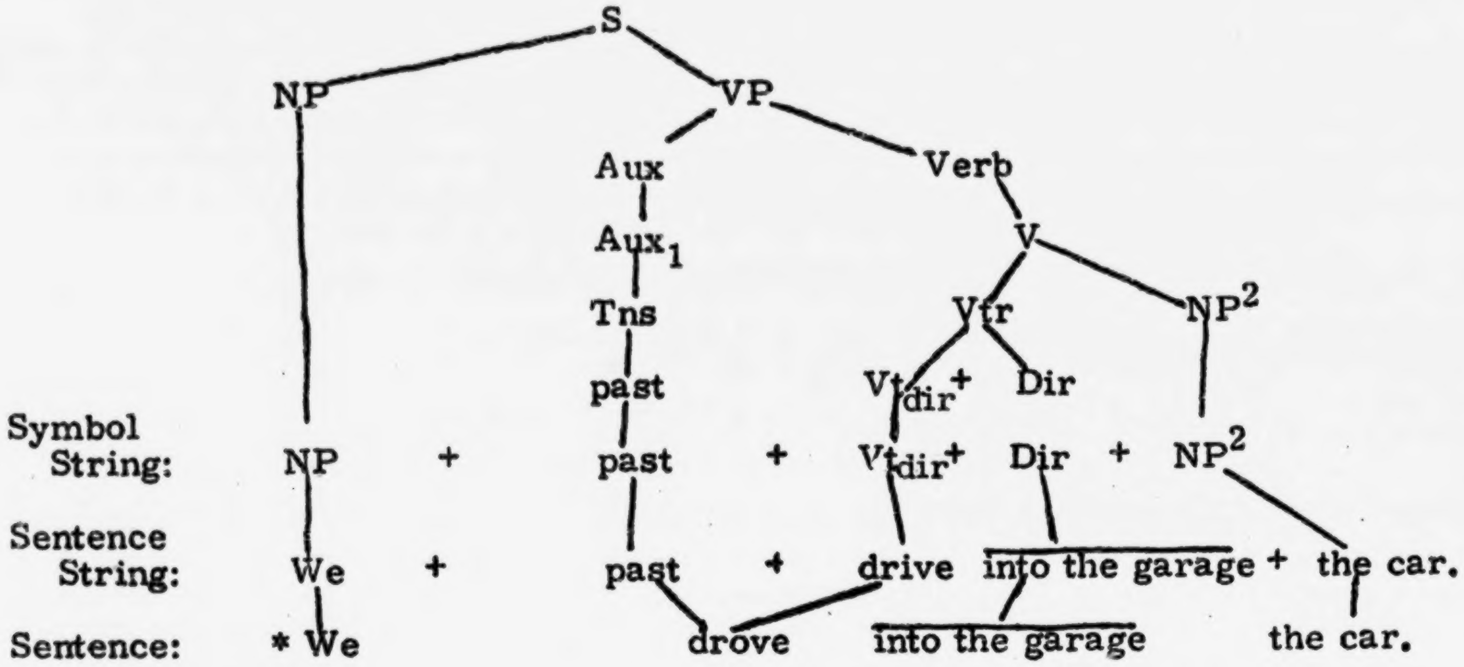
6. The conductor ran toward the station.
7. The man directed the boys to the exit.
8. Jim led the donkey toward the gate.
9. She drove the car away.
10. Jack guided the ball into the basket.

We think of the adverb of direction as being very closely attached to the transitive verb of direction because it occurs with this particular sub class and not with others. We say that the adverb of direction comes into the sentence attached to this subclass of verbs which we have called Vt_d. Therefore it will appear in the branching diagram in this way:


V
Vtr
NP2
Vtdir
Dir
Symbol String:
Vtdir + Dir + NP2

The NP^2 is, of course, the direct object NP which must accompany any transitive verb. The following diagram shows how Vt_{dir}+ Dir appears in the sentence string.

We drove the car into the garage.


S
NP
VP
Aux
Verb
Aux1
V
Tns
Vtr
NP2
past
Vtdir+
Dir
Symbol String:
NP + past + Vtdir+ Dir + NP2
Sentence String:
We + past + drive into the garage + the car.
Sentence:
* We drove into the garage the car.

We can see that the phrase structure rule which adds Vt_{dir} + Dir results in an ungrammatical sentence. Perhaps you recall that the same situation exists with the indirect object verb. The Vt_{io} brings with it into the phrase structure an indirect object (IO), which comes between the verb and the NP^2. The result is an ungrammatical string.

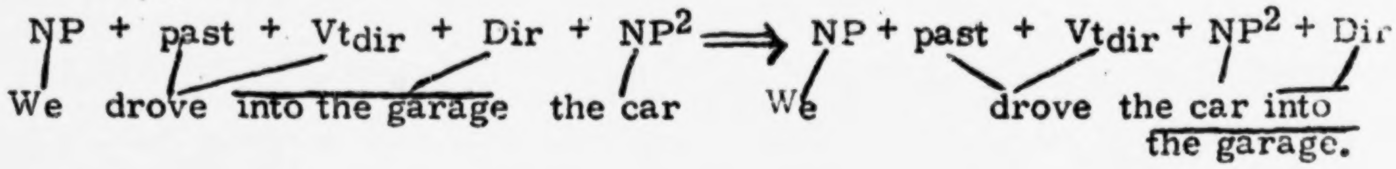
Example: Robert gave to the girl the bracelet.

To produce a grammatical sentence, a transformation must take place. What two alternative transformations did we discover would make this sentence grammatical?

1. We can move the IO to a position after the NP^2.
   (Robert gave a bracelet to the girl.)
2. We can delete the preposition in the IO.
   (Robert gave the girl a bracelet.)

So we see that the order of elements in the grammatical sentence is the result of a transformation.

Similarily, the Vt_{dir} + Dir brings something into the sentence string between the verb and NP^2 and produces an ungrammatical order.
Example: We drove into the garage the car.
What can be done to make it grammatical? In this case, unlike the indirect object, we have only one choice for making it grammatical. What is "into the garage" in this sentence? This directional adverb is the element which must be moved to make the sentence grammatical.
We drove the car into the garage.
Let's write the symbol strings for these two sentences to show what happens in the transformation.


NP + past + Vtdir + Dir + NP2 ⟹ NP + past + Vtdir + NP2 + Dir
We drove into the garage the car We drove the car into the garage.

This shows us that we can write the rule for this transformation in this way.

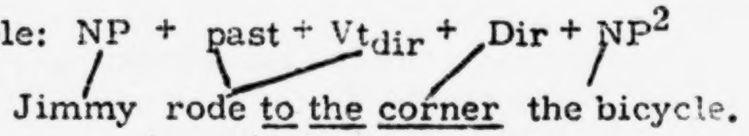
$$T_{Dir}\ \boxed{NP + past + Vt_{dir} + Dir + NP^2 \Longrightarrow NP + past + Vt_{dir} + NP^2 + Dir}$$

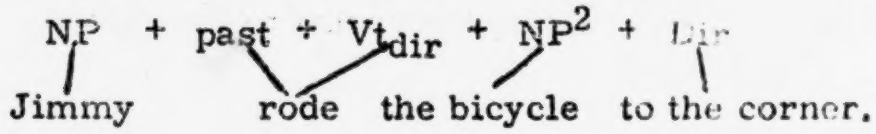
When the directional adverb is a single word does the same thing happen?

The teacher sent home the girl. ⟹ The teacher sent the girl home.

Exercise 3: Copy the sentences and underline the part of each which functions as the directional adverb. Write the symbol string for each sentence and perform the obligatory transformation to make each one grammatical. Write symbol strings for the transformed sentences also.

Example:


NP + past + Vtdir + Dir + NP2
Jimmy rode to the corner the bicycle.

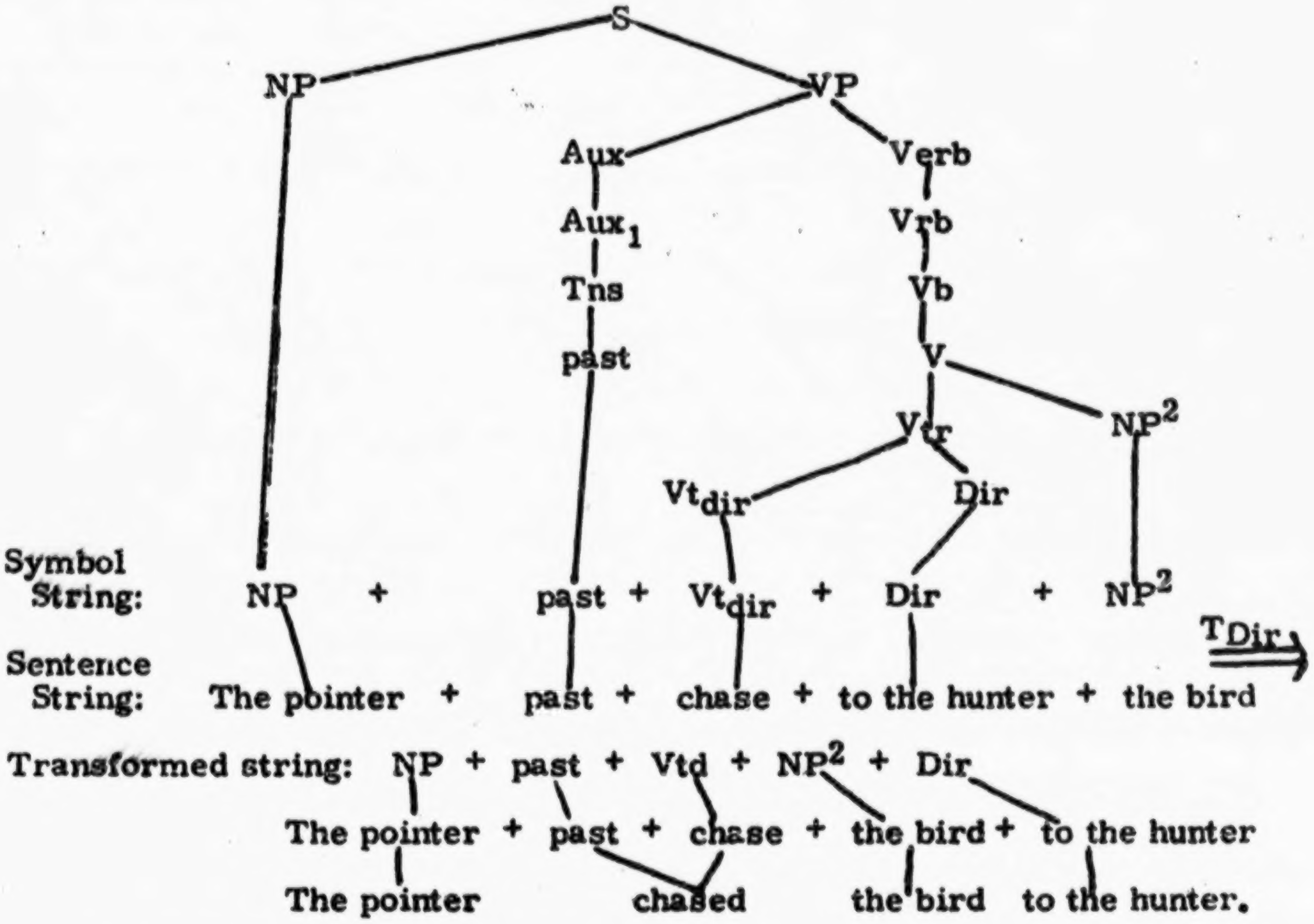

NP + past + Vtdir + NP2 + Dir
Jimmy rode the bicycle to the corner.

A. 1. The teacher sent home the girl.
   2. The boy drove into the garage the car.
   3. The girl sent here her sister.

4. The dog guided into the fold the sheep.
5. He drove into the field the horses.
6. He guided toward the exit the boys.
7. The farmer sent to town the grain.
8. The driver drove toward the marketplace his cattle.

B. Make sentence diagrams for the following sentences. Perform the obligatory transformation on your sentence string to make it grammatical. In order to save space, do not develop the NP's. Just bring them down to the symbol string as NP's.

Example: The pointer chased the bird to the hunter.


S
NP
VP
Aux
Verb
Aux1
Vrb
Tns
Vb
past
V
Vtr
NP2
Vtdir
Dir
Symbol String: NP + past + Vtdir + Dir + NP2
TDir
Sentence String: The pointer + past + chase + to the hunter + the bird
Transformed string: NP + past + Vtd + NP2 + Dir
The pointer + past + chase + the bird + to the hunter
The pointer chased the bird to the hunter.

1. John sent his sister to the store.
2. The hunters chased the deer toward the woods.
3. A dog has carried this bone into the yard.
4. A truck will take the papers to the warehouse.
5. The computer is guiding the rocket to the moon.

What have you learned?

1. One sub class of transitive verb is the Vt_{dir} + Dir.

2. This class of verb has attached to it a directional adverb, which answers the question "Where to?"

3. The directional adverb may be a phrase or sometimes a single word.

4. This Vt_{dir} + Dir appears in the diagram and in the sentence string before NP^2, and produces an ungrammatical sentence.

   Example: The cat $\overset{Vt_{dir}}{\underline{\text{brought}}}$ $\overset{Dir}{\underline{\text{to the door}}}$ $\overset{NP^2}{\underline{\text{the mouse}}}$.

5. An obligatory transformation is necessary to move the directional adverb to a position immediately following the NP^2.

   The cat brought the mouse to the door.

TRANSITIVE VERBS WITH PARTICLES

You are beginning to discover that there are many types of transitive verbs. Besides the simple transitive followed by $\underline{NP}^2$, you should now be able to recognize the special class of transitive called the indirect object verb (Vtio) and the class which is accompanied by the directional adverb. ($\underline{Vt_{dir}}$). What is the one test that is applicable to all transitive verbs? What additional test is applicable only to an indirect object verb? What is the test for the Vt_{dir} class?

Exercise 1: List the root form of the verbs in the following sentences and label each with the symbol which indicates what type of verb it is. Be able to explain your answer.
Example: Father brought Jane a surprise.
bring -- Vt_{io}

A. 1. He drove the car into the garage.
2. John sent Sally a letter.
3. John baked Jill a cake.
4. Gerry received the award.
5. The man drove his car home.
6. The oriole has built a nest in the cherry tree.
7. The boy asked the teacher a question.
8. We sent a rocket toward the moon.
9. He is typing his exam.
10. She gave some cheese to the mouse.

B. Write the underlying strings for the sentences in A., and indicate if each is the string produced by the phrase structure rules or if it is the result of a transformation. If it is a transformed string write the underlying string from which it came. In case of doubt, diagram the sentence.

Example: $NP + past + Vt_{io} + NP^3 + NP^2$

Father brought Jane a surprise.

This is a transformed string from

$NP + past + Vt_{io} + prep + NP^3 + NP^2$

Father brought to Jane a surprise.

In the exercise above how do sentences 2, 3, and 7 differ? How are sentences 1, 5, and 8 alike? What is "in the cherry tree" in sentence 6?

In the last unit you learned that all sentences which contain a Vt_{dir} verb are the result of a transformation. The Dir (directional adverb) comes into the sentence with the verb. Then it must be moved to a position following the NP^2.

Example: $NP + past + Vt_{dir} + Dir + NP^2$

The boy shot toward Death Valley the arrow.

$NP + past + Vt_{dir} + NP^2 + Dir$

The boy shot the arrow toward Death Valley.

What kind of verbs do you find in each of the following sentences?

Exercise 2: Copy the following sentences and write the symbol strings above each.

Example: $NP + past + Vt_{dir} + NP^2 + Dir$

Ed pushed the car to the station.

1. Mick rowed the boat to shore.
2. Father plunged the knife into the roast.
3. The librarian put the books on the shelf.
4. I stuck the key into the lock.
5. Jerry has taken his work to school.
6. The pitcher threw the ball to the umpire.
7. A monkey was hurling coconuts to the ground.
8. Joan threw the coffee out.

In each case you probably found an element which answers the question "Where to?" and therefore decided that each sentence contained a Vt_{dir} verb. We found that when a sentence contains a Vt_{dir} verb the directional adverb is an essential part of the verb and appears right after it in the phrase structure string. Sometimes the Dir is one word (home); sometimes it consists of a preposition + NP (toward the market). Whichever it is, the sentence containing it is not grammatical until it has undergone an obligatory transformation in which the directional adverb is moved to a position right after the NP^2.

Example: Mick rowed the boat to shore.
is a transform of Mick rowed to shore the boat.

Exercise 3: Write the underlying symbol strings for each of the sentences above, showing what they were before the transformation.

Example: $NP + past + Vt_{dir} + Dir + NP^2$

Ed pushed to the station the car

Look carefully at sentence #8. It seems to have a verb like the Vt_{dir} verbs of the other sentences.

1. Mick rowed to shore the boat.
2. Joan threw out the coffee.

In each case we have attached to the verb an element which answers the question where to? How do they differ? In #1 it is necessary to perform a transformation to produce a grammatical sentence. Is a transformation necessary for #8? We can say

Joan threw out the coffee

or

Joan threw the coffee out.

How is the verb in sentence #8 different, then, from the Vt_{dir} of the other sentences? We can say that in sentences with Vt_{dir} the Dir element must be transformed to a position beyond the NP^2 to produce a grammatical sentence. But in sentences with verbs like threw out, the element attached to the verb may, or may not, be transformed to the position beyond the NP^2.

We will call elements like out in sentence #8 particles. They come into sentences attached to certain transitive verbs and are really a part of the verb structure, just as the IO or the directional adverb are really parts of the verb structure. When we make the sentence passive these particles stay with the verb. (Joan threw out the coffee. The coffee was thrown out by Joan). But they can be moved to a position beyond the direct object (NP^2). We will use the symbol $Vt_{prt} + Prt$ to indicate this particular subclass of transitive verbs. The Vt reminds us that the verb is a subclass of transitive verbs. The prt indicates that this class brings with it an element which we call a particle.

In Joan threw the coffee out the particle out seems to answer the question where to, but it should not be confused with directional adverbs. We must ask if all particles answer this question. Look at the following:

I looked over the report.
I looked the report over.

Is over a particle? How do you know?

The committee looked up the information.
The committee looked the information up.

Is up a particle in these two sentences? How do you know?

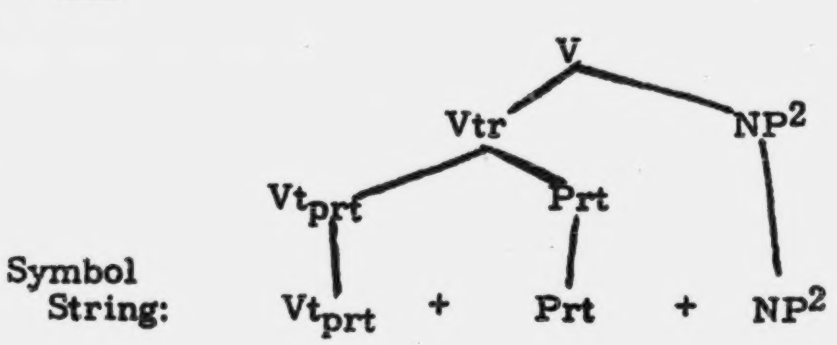
Neither up nor over in the sentences above answer the question "where to". We can conclude that particles aren't necessarily like directional adverbs. The important thing to remember about particles is that they are really a necessary part of the verb. (We wouldn't say "The committee looked the information." or "I looked the report.") and they can appear either before or after the direct object (NP^2). Transitive verbs with particles are different from the other transitive verbs because of the movable nature of the particle. They are a special subset.

Now, how can we include this additional subclass of transitive verb in rule 10.2 which rewrites Vtr? It is the third subclass of transitive verb which we have identified. What are the other two? We can add it to the rule as we did the other subclasses, making use of the symbol (. . .) to show that there are other types which we haven't defined yet. With the addition of the class of particle verbs the rule should now look like this:

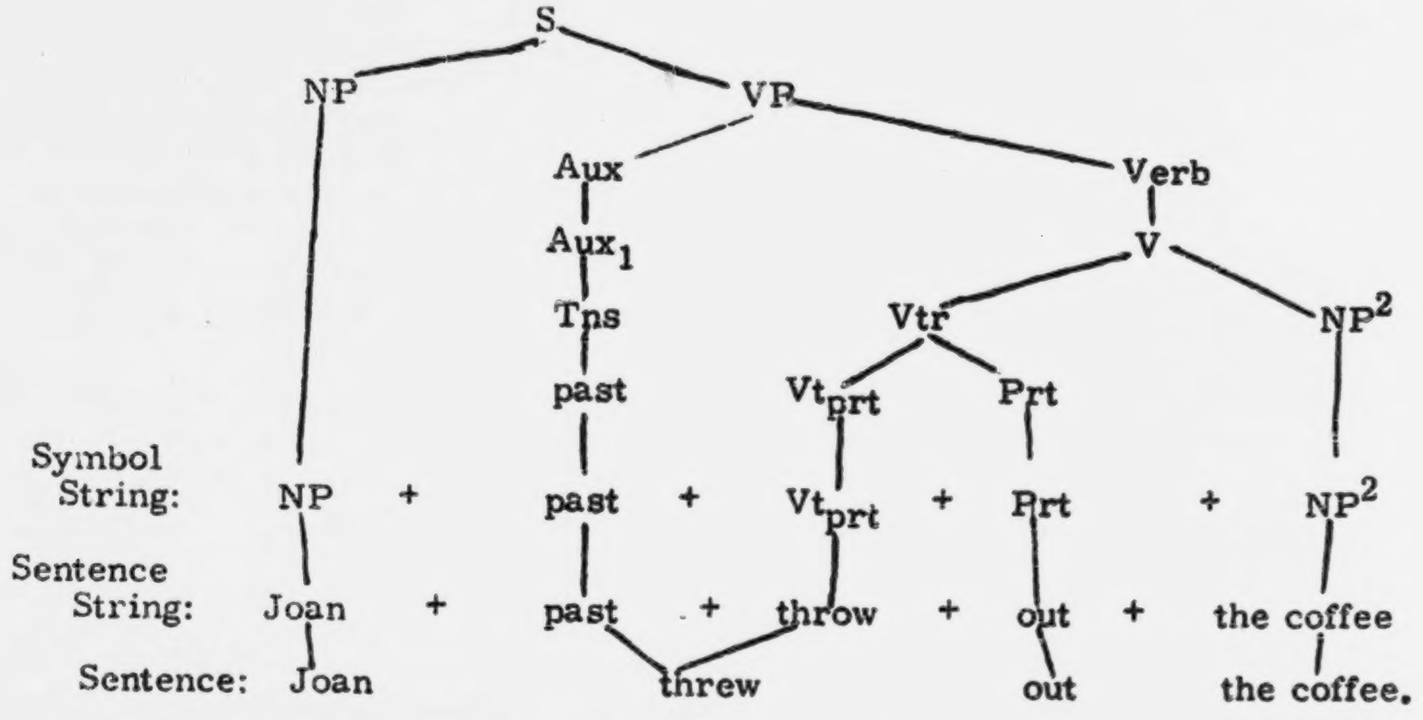
Rule (10.2)

$$\boxed{Vtr \longrightarrow \left\{ \begin{array}{l} V_{tio} + IO \\ Vt_{dir} + Dir \\ Vt_{prt} + Prt \\ \ldots \end{array} \right\}}$$

Like the others, the particle verb appears in the diagram as a sub class of Vtr.



The diagram for Joan threw out the coffee would look like this:


S
NP
VP
Aux
Verb
Aux₁
V
Tns
Vtr
NP²
past
Vtprt
Prt
Symbol String: NP + past + Vtprt + Prt + NP²
Sentence String: Joan + past + throw + out + the coffee
Sentence: Joan threw out the coffee.

You will recognize the Vt_{prt} verbs by the fact that the particle can follow the verb immediately or it can move out beyond the NP^2.

Exercise 4: Try to identify the kind of verb in each of the following.

1. Bradford gave the group a trophy.
2. The teacher might read the class a poem.
3. Candice threw out the flowers.
4. Jill put away the paper.
5. My cousin brought up the question.
6. The Communists will take over the government.
7. Father took Bill to the woodshed.
8. The men blew up the still.
9. You can lead a horse to water.
10. The child turned on the lights.

We have found that sentences with Vt_{prt} verbs are grammatical either when the particle immediately follows the verb or when it is moved beyond the NP^2.

(Jill put away the paper. ⟹ Jill put the paper away.)
When it is moved it is of course going through a transformation but unlike the transformation for Dir and IO it is optional. How can we write this transformation rule? Only the Vt_{prt} + Part + NP^2 is involved, so we will use elipsis marks (. . .) for the rest of the sentence. We will call it the particle transformation.

T prt $\boxed{\ldots Vt_{prt} + Prt + NP^2 \ldots \Longrightarrow \ldots Vt_{prt} + NP^2 + Prt. \ldots}$

Before leaving the Vt_{prt} verbs we must see what happens when the NP^2 happens to be a pronoun. (You know that a pronoun is a special kind of NP.)

Exercise 5: In the following pairs of sentences the particle appears in two positions. In each pair, substitute an appropriate pronoun for the NP^2 (him, her, it, them). Then decide which sentence in each pair is grammatical when the NP^2 is a pronoun. Star the ungrammatical sentences.

Example: Joan threw out the coffee. *Joan threw out it.
Joan threw the coffee out. Joan threw it out.

1. Jill put away the paper.
   Jill put the paper away.

2. Susy brought in her friends.
   Susy brought her friends in.

3. Jane brought up the question.
   Jane brought the question up.

4. The Communists will take over the country.
   The Communists will take the country over.

5. The men blew up the bridge.
   The men blew the bridge up.

6. The coach pointed out the boy.
   The coach pointed the boy out.

7. The men pitched in the hay.
   The men pitched the hay in.

8. He called over the waitress.
   He called the waitress over.

Which of your rewritten sentences were grammatical, those in which the particle was left attached to the verb, or those in which the particle was moved to a position after the NP^2? From your observation of the above sentences how would you answer the following questions?

1. When the NP^2 following a Vt_{prt} verb is a noun, is the particle transformation obligatory or optional?

2. When the NP^2 following a Vt_{prt} verb is a pronoun, is the particle transformation obligatory or optional?

Exercise 6: In which of the following sentences is the particle transformation obligatory and in which is it optional?

1. The president called out the guards.
2. My brother put in a dollar.
3. Fred put on the boots.

4. Fred put on them.
5. The coach sent in the waterboy.
6. A dog chewed up the hose.
7. The coach sent in him.
8. The magician pulled out the rabbit.
9. A cat tore up it.
10. The fireman pulled out him.

What have we learned, so far, about the transitive verb?

We know that all transitive verbs are followed by an NP^2 (sometimes called the direct object).

We know that all transitive verbs are capable of the passive transformation.

We have identified three sub classes of the large class of transitive verbs.

We can recognize indirect object verbs.
(What is the test for an indirect object verb?
What sentence element is attached to the indirect object verb?
What are the two parts of the indirect object.)

We can recognize a Vt_{dir} verb.
(What question does the directional element answer?
Where must the directional element be placed in a grammatical sentence?)

We can recognize Vt_{prt}
(How can we recognize a particle?
What happens in a sentence with a Vt_{prt} verb if the direct object is a pronoun?)

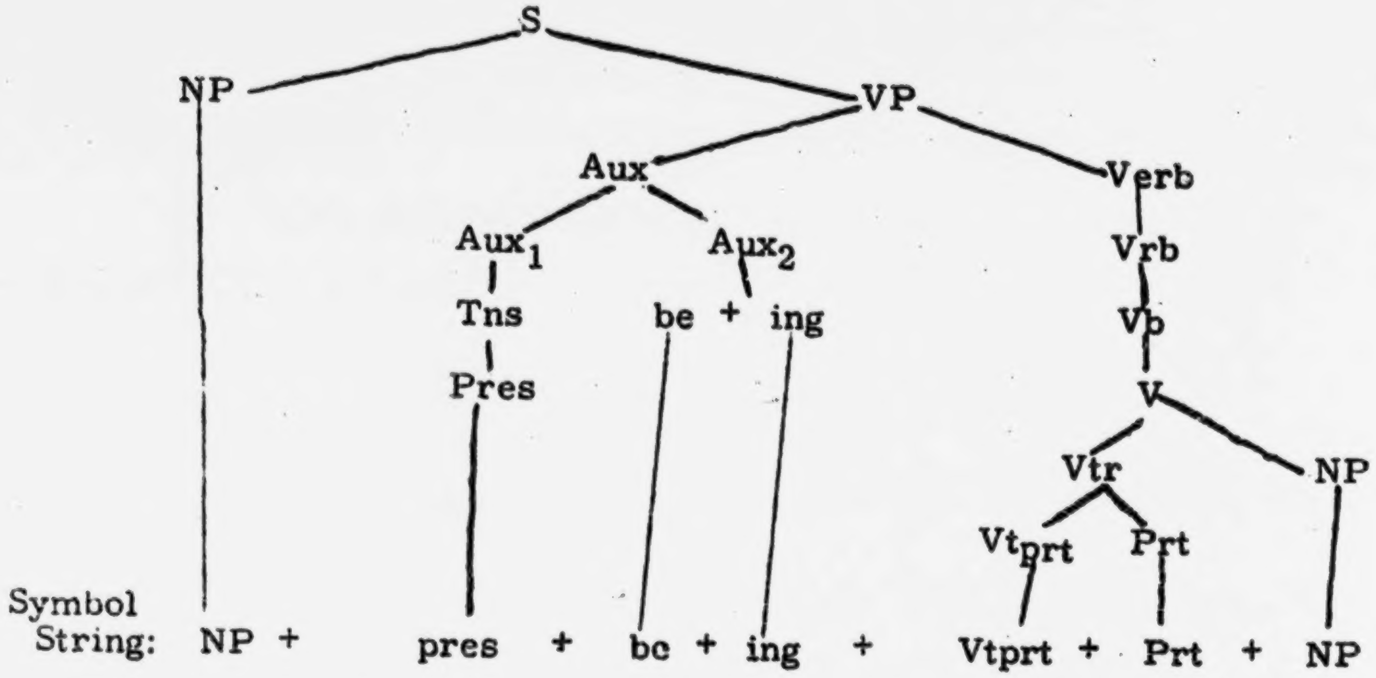
Testing what we know.

Exercise 7: Identify the verbs in the following sentences.
Part A

1. The child stuck out his tongue.
2. The manager made the team an offer.
3. The natives will take him in.
4. Peter took the princess to the dance.
5. Joe asked her a question.
6. The sailor dragged the whale to shore.
7. The company built him a house.
8. Their parents give them an allowance.
9. The horse pushed open the gate.
10. Bill ran the car into the fence.

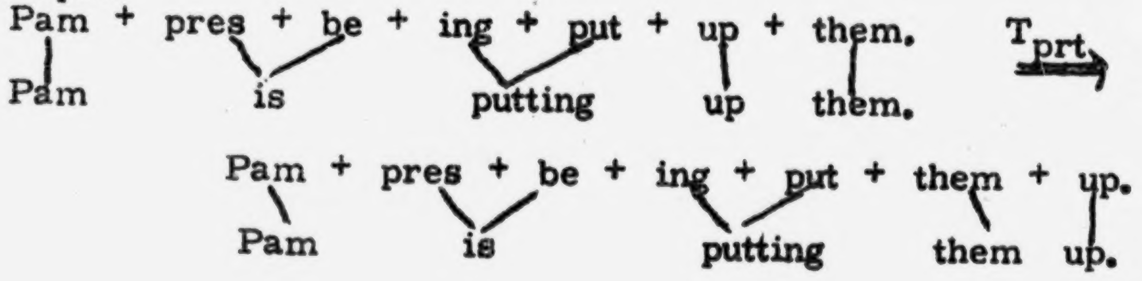
Part B. Diagram the sentences in A. In order to save space, do not develop the NP's.

Example:
Pam is putting them up.


S
NP
VP
Aux
Verb
Aux1
Aux2
Vrb
Tns
be + ing
Vp
Pres
V
Vtr
NP
Vtprt
Prt
Symbol String: NP + pres + be + ing + Vtprt + Prt + NP

C. When the diagrams produce ungrammatical sentences, perform the necessary transformations to produce the grammatical sentences above.

Example:

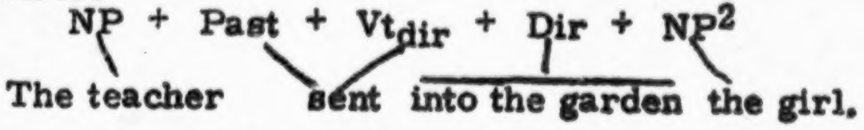

Pam + pres + be + ing + put + up + them.
Pam is putting up them.
T_{prt}
Pam + pres + be + ing + put + them + up.
Pam is putting them up.

TRANSITIVE VERBS WITH PREPOSITIONS

We have discovered that the transitive verb has many subclasses, each of which behaves in a special way. As we have identified each new subclass we have added it to the rule which says that transitive verbs can be rewritten as one of its many types.

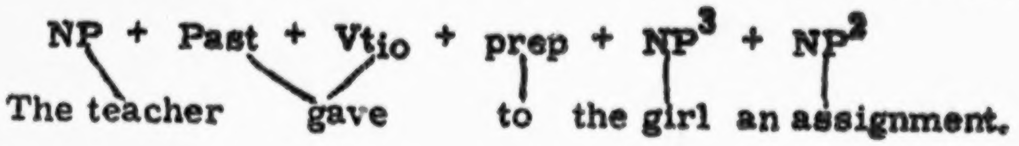
In each of the subclasses which we have identified the verb has something attached to it which adds another element to the sentence string. The indirect object verb (V_{tio}) is followed by an indirect object. The particle verb (Vt_{prt}) is followed by a word we called a particle, and the Vt_{dir} is accompanied by a directional adverb. In each case the element which characterizes the verb is attached to it in the phrase structure sentence string.

For example, the symbol string underlying "The teacher sent the girl into the garden" is:


NP + Past + Vtdir + Dir + NP2
The teacher sent into the garden the girl.

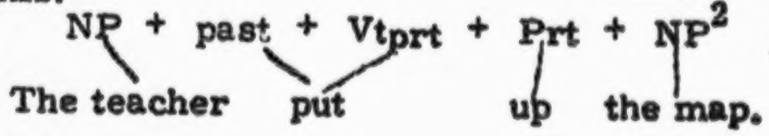
It is necessary to transform this sentence in order to make it grammatical? What transformation must take place?

Similarly the underlying string of sentences containing indirect objects produce ungrammatical sentences which must be transformed.


NP + Past + Vtio + prep + NP3 + NP2
The teacher gave to the girl an assignment.

What possible transformations can take place here?

The underlying string of a sentence with a Vt_{prt} verb produces sentences like this:

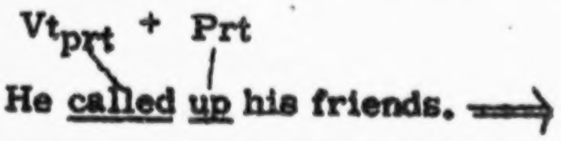

NP + past + Vtprt + Prt + NP2
The teacher put up the map.

Is a transformation necessary for sentences with particles? Is it possible? Is it ever obligatory?

So we see that in each of the subclasses of transitive verbs which we have studied so far it is possible to move the element which attaches to the verb to a position beyond the NP^2. Now we want to talk about another kind of transitive verb and see how it resembles and how it differs from the ones we have studed so far.

Exercise 1: Copy the following sentences and identify as many of the verbs as you can by applying the tests you have learned. In cases where it is possible, move the element which have come into the sentence attached to the verb. If it has already been moved, say so.

Example:


Vtprt + Prt
He called up his friends.

He called his friends up.

1. John threw the towel away.
2. We drove the car into the garage.
3. Joan looked at the painting.
4. Many people give contributions to the Red Cross.
5. We headed the boat toward the island.

6. Joe talked about rockets.
7. Grandfather paid for the gas.
8. Mary made up the story.
9. Laura took her mother to the store.
10. They tried on coats.

Did you find any sentences which you were unsure of? Look at the verbs in sentences #3, #6, #7. Are these transitive verbs? Can they be made passive?

3. Joan looked at the painting.
The painting was looked at (by Joan.)

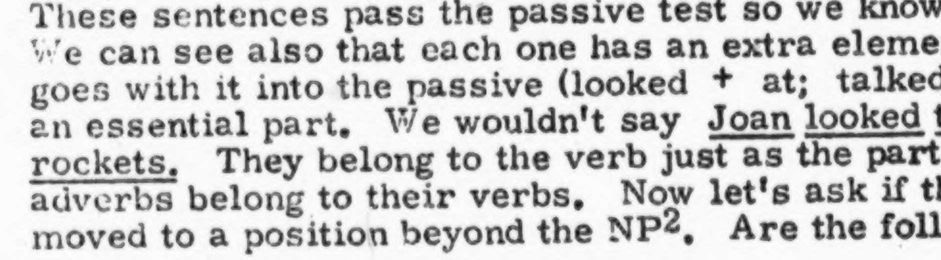
6. Joe talked about rockets.
Rockets were talked about (by Joe.)

7. Grandfather paid for the gas.
The gas was paid for by grandfather.

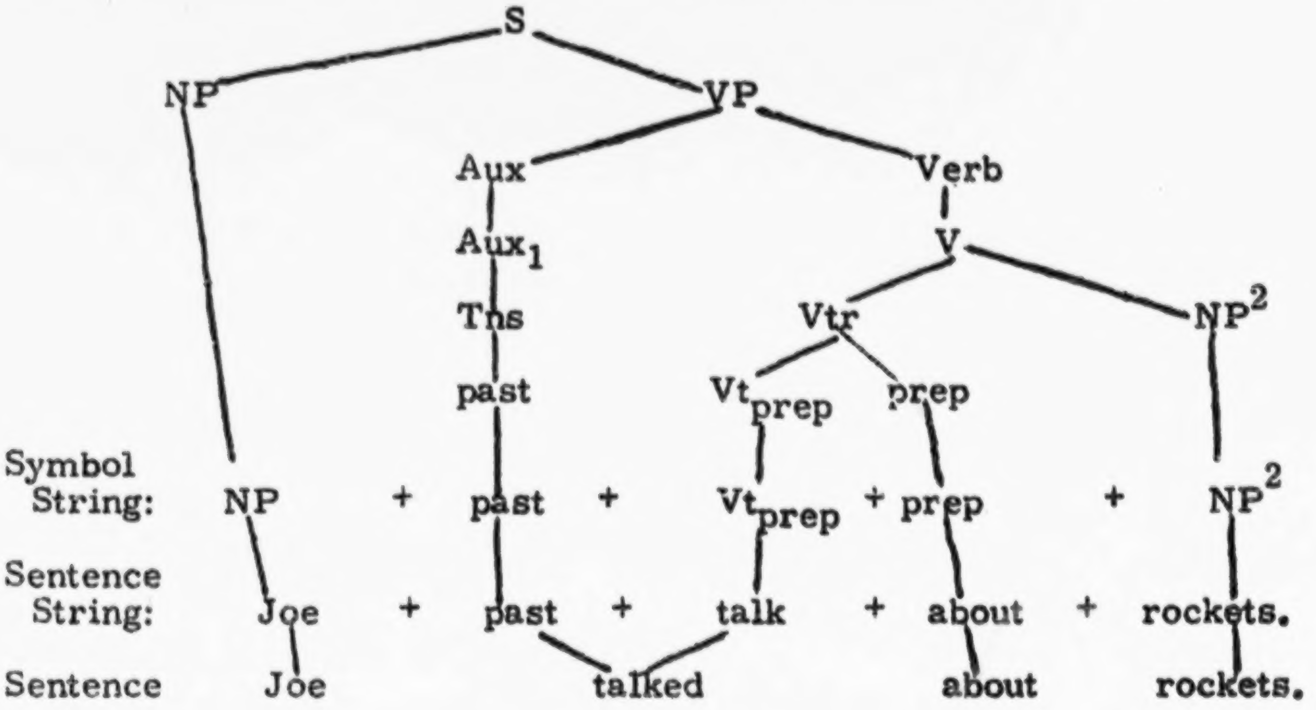
(Remember that when the passive seems awkward it is because we often delete the agent after the transformation has been made. Thus we would probably say The painting was looked at.; Rockets were talked about.; etc., but they would still be passive constructions.)
These sentences pass the passive test so we know they are transitive verbs. We can see also that each one has an extra element attached to it which goes with it into the passive (looked + at; talked + about;) and which is an essential part. We wouldn't say Joan looked the painting or Joe talked rockets. They belong to the verb just as the particles and directional adverbs belong to their verbs. Now let's ask if these elements can be moved to a position beyond the NP^2. Are the following possible?

*Joan looked the painting at.
*Joe talked rockets about.
*Grandfather paid the gas for.

We can see that unlike particles, the elements that attach to these particular transitive verbs can not be moved. They must stay right with the verb. The transformation which was obligatory with the directional verb and optional with the particle verb is impossible with this verb. Such a transformation would result in an ungrammatical structure. These unmovable elements which attach to a certain class of transitive verb are, of course, prepositions. They really seem a part of the verb itself. We will label this particular kind of transitive verb Vt_{prep} + prep. It will appear in the diagram in this way:



We would diagram Joe talked about rockets in this way:


S
NP
VP
Aux
Aux$_1$
Tns
past
Verb
V
Vtr
Vt$_{prep}$
prep
NP^2
Symbol String: NP + past + Vt$_{prep}$ + prep + NP^2
Sentence String: Joe + past + talk + about + rockets.
Sentence Joe talked about rockets.

How can we show that a transitive verb may be a Vt$_{prep}$ + Prep? Since this is another subclass of transitive verbs we will want to change rule (10.2) to include this new subclass. The elipsis (. . .) must remain in the rule, because there are many verbs of this class which are not included in the four subclasses we have identified.

Rule (10.2)

$$\boxed{\text{Vtr} \rightarrow \left\{\begin{array}{l} \text{Vt}_{io} + \text{IO} \\ \text{Vt}_{dir} + \text{Dir} \\ \text{Vt}_{prt} + \text{Prt} \\ \text{Vt}_{prep} + \text{Prep} \\ \ldots \end{array}\right\}}$$

Exercise 2: A. Examine the following sentences and label the verb of each. Give a reason for your choice.

Example: Bill $\overset{\text{Vtio}}{\underline{\text{gave}}}$ his father the money.

This is an indirect object verb because it is followed by 2 NP's and it can be made passive in 2 ways.

1. Jill looked at John.
2. Neil threw the ball into the basket.
3. The girls flirted with the boys.
4. The boys kicked at the door.
5. The boys kicked the door out.
6. The teacher objected to the noise.
7. The women gossiped with their neighbors.
8. The women talked about the movie.

9. The boys depend on their leader.
10. The deer struggled against the lion.
11. The old lady slipped on her coat.
12. The old lady slipped on a banana peel.
13. Little Jack Horner put in his thumb.
14. Jack Horner pulled out a plum.

B. Make branching diagrams for sentences 1, 2, 3, 5, and 9. In order to save space, do not develop the NP's. When the diagram results in a sentence which requires a transformation to produce the sentence you started with, perform that transformation.

Look again at sentences 11 and 12 which seem to have the same verb.

The old lady slipped on her coat.
The old lady slipped on a banana peel.

Are these really the same verb? We can test them by trying to move the on. Can we say

The old lady slipped her coat on.

Can we say

The old lady slipped a banana peel on.

So we see that the verb in the first sentence is Vt_{prt} + Part. What is the verb in the second?

What have you learned?

What is the difference between a Vt_{prep} + Prep verb and a Vt_{prt} + Part verb? What is the difference between a Vt_{prep} + Prep and a Vt_{dir} + Dir?

Exercise 3: Write two sentences for each of the following strings:

1. NP + past + Vt_{prep} + Prep + NP^2

2. NP + past + Vt_{prt} + NP^2 + Part.

3. NP + pres + Vt_{prep} + Prep + NP^2

4. NP + past + Vt_{prt} + Part + NP^2

5. NP + past + Vt_{dir} + NP^2 + Dir

Exercise 4: Write symbol strings for each of the following sentences.

1. We will subscribe to the magazine.
2. The lawyer is looking over the evidence.
3. The manager will make you an offer.
4. The President called out the National Guard.
5. Keith should have advanced the bishop to that square.
6. The tractor ran over the log yesterday.
7. The teacher extended the deadline to Tuesday.
8. Maria has sung her father a song.
9. The cat had lapped the milk up quickly.
10. The cousins carried on a correspondence.

Cumulative Review

A. Make branching diagrams for the following sentences:

1. Some butter was melting on the stove.
2. The clerk has made out an order.
3. The sky became dark suddenly.
4. The nurse will give you a shot.
5. The classes have been having a contest today.

B. Write the kernel sentences which underlie the following. (Double space your sentences.)

1. The children sneaked carefully through the haunted house.
2. Some birds have been killed by insecticides.
3. When will you have your big exam?
4. The juniors and seniors are attending school this week.
5. The girl's father called up the teacher.
6. The donations are being picked up on Monday.
7. Crawford brought bread and pickles to the party.
8. The experiment called for sulfuric acid and sodium chloride.
9. The small mouse crawled into the snake's hole.
10. Snorky dragged the bone into the house.
11. Gerry brought her mother a plant.
12. I gave the report which I was preparing in the library.

C. Write symbol strings for the kernels you wrote in B.

DETERMINERS

I. Introduction to the Student

When you last studied the rules that produce (or generate) noun phrases, you simply used a symbol (T) to stand for those words that occur in front of nouns: NP → T + N + N^o. In the unit that explained Phrase Structure Rule 13, it was pointed out that there were several kinds of determiners--that is, structures which occur in front of nouns. The most common of these determiners were the, a, an, and some.

Although the number of words (or groups of words) that can appear before nouns is not very large, determiners are one of the most difficult parts of our language. In fact, one way that we can tell whether or not a person is a native speaker of English is by observing his use of determiners. Foreigners may often say things like the following: * "Man in hat on corner is father of John" or * "I went to the Mount Rainier." The proper use of determiners is a major problem for those learning English as a second language.

Exercise 1: As an exercise to determine the importance of determiners, rewrite the following paragraph, leaving out all the determiners which you can find before nouns and adding determiners to those nouns which do not now have them.

> A boy stood on the corner waiting for a bus to pick him up. He had an hour to get to Chicago. Some pigeons were picking at crumbs in the gutter. The boy had always liked pigeons and he wished he had food to give them. Suddenly a bus rounded the corner scattering the pigeons and screeching to a halt. A crowd of people got off and the boy pushed past them into the bus. As he rode toward Chicago he thought of the pigeons in the street.

In this unit, you will study some rules that show more specifically what T can be in English sentences. T stands for that complex group of words which can precede the noun in any noun phrase. But in the interest of simplicity, we shall deal in this unit with only the most common determiners: the, a, an, and some. These form a special class of determiners called articles.

II. A Rewrite Rule for Determiners

Grammarians have usually called the, a, and an "articles," but the word some has not always been included in this group. However, since some has such a close relationship to both a and an, we shall include some in our discussion of those determiners called articles. The reasons for doing this will become apparent in the discussion which follows.

Which words are determiners in the following sentences?

(1) A boy looked at the candy longingly.
(2) Some girls in the class asked questions.
(3) The soldier ate rice and an egg.

The words *a, an, some,* and *the* are determiners wherever they occur in these sentences. Notice that they seem to occur regularly in front of nouns. Why is there no determiner in front of words like *questions* and *rice*? Do you recall how this was explained in an earlier unit? You were told that our grammar would be simpler if we assumed that the determiner sometimes selected in front of words like *rice* (N_{mass}) and *questions* (N_{cnt} + plur) was the empty set. In other words, we think of the NP as being described by the rule $NP \rightarrow T + N + N^o$, but we often find that the symbol *T* is actually replaced by a zero sign (∅) in the sentence string.

In this unit we shall try to be more specific about where *the, a, an,* and *some* occur in English sentences. We will try to form a rule which will describe *T* in a more specific way. Before we do this, notice what occurs on both sides of the determiner in the following sentences:

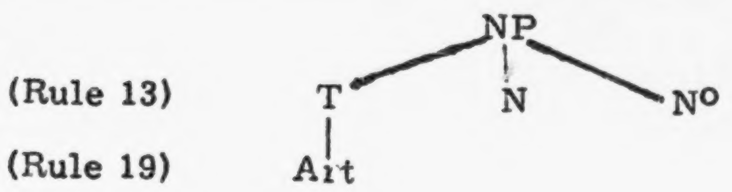
(4) Ten of *the* last few trucks were overloaded.
(5) Many of *the* other men seemed happy.

Apparently many kinds of words may occur before the *noun* in the noun phrase. Notice that in these two examples some of the words come before the determiner and some come after the determiner, but before the noun. We shall not try to account for words like "ten of," "last few," "many of," or "other" in this unit, but we will want to try to explain them in a later unit. Thus the rule which we write to expand *T* must be written in such a way that we can add other items before and after the simple determiners like *the.* Since we have seen that these simple determiners, which we have called *articles,* are one kind of determiner appearing in front of nouns, let us try to write a rule to state this fact. In other words, let's write a rule that says that one way in which *T* (determiner) can be expanded is as *article.* We will use *Art* as the symbol for *article.*

For the present, then, let us rewrite *T* as *Art.* The new rule can take the following form.

Rule (19) T ---> Art

Thus, wherever the symbol *T* appears in a string of symbols, you are to rewrite it as *Art.* Later, we will add other items to this rule, since it is obvious that other words besides articles can appear before nouns. The new rule affects your branching diagrams in the following way:



Definite and Indefinite Articles

The symbol *Art*, then, stands for one group of items that can occur as determiners. This group of items includes the words *the*, *a*, *an*, and *some*. Do all four of these words behave exactly alike? Let us try to find one or more characteristics possessed by some articles but not possessed by others. Of the four articles, which one can occur in the following blanks?

_________ fact that you like grammar pleases the teacher.
I did not like _________ idea that you were alone.

In these and similar contexts, only the word *the* seems to be grammatical. On the other hand, *the* is not grammatical in context like the following:

It is _______ fact that you understand grammar.
The mob was met by _________ mere boy.
_________ mere boys provided opposition.

The behaves quite differently from the other articles. Not only does it appear in places where the other articles do not, but sometimes it cannot appear where *a*, *an*, and *some* are perfectly grammatical. In addition to this, we find that *the* gives a special meaning to those nouns which follow it. Look at the following pairs of sentences:

The man sat up.
A man sat up.

The airman looked lazy.
An airman looked lazy.

How would you like *the* rice?
How would you like *some* rice?

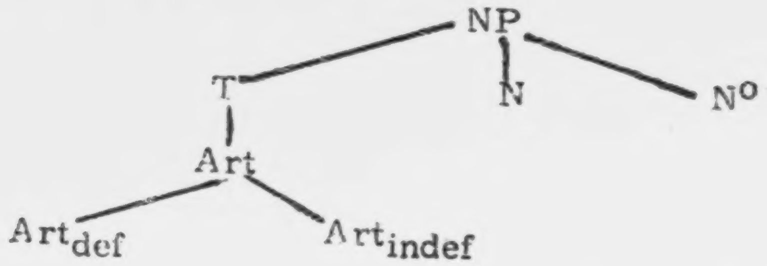
In each pair what is the difference between the meaning of the noun phrase containing *the* and that containing *a*, *an*, or *some*? For example, how does "the man" differ in meaning from "a man"? The noun phrase "the man" singles out a particular man, but "a man" is not definite in singling out which man is meant. In each of the other pairs of sentences, we can observe the same distinction of definiteness (associated with *the*) and non-definiteness (associated with the other articles). Thus we see that a meaning difference accompanies the formal distinction previously made between *the* and the other articles. The article *the* specifies a particular one of a class of nouns, but the articles *a*, *an*, and *some* do not have this power. We can characterize this meaning difference as one of *definiteness* and *indefiniteness*.

How can we write a rule that will distinguish between the article *the* and the other members of this class? Remember that we are simply rewriting the symbol *Art* which was introduced in Rule (19). We want to show that in a NP, the article will be either definite or indefinite. Using Art_{def} to stand for definite and Art_{indef} to stand for the indefinite articles, we can specify the two classes in a rule like this:

Rule (20) Art ---> $\left\{ \begin{matrix} \text{Art}_{\text{def}} \\ \text{Art}_{\text{indef}} \end{matrix} \right\}$

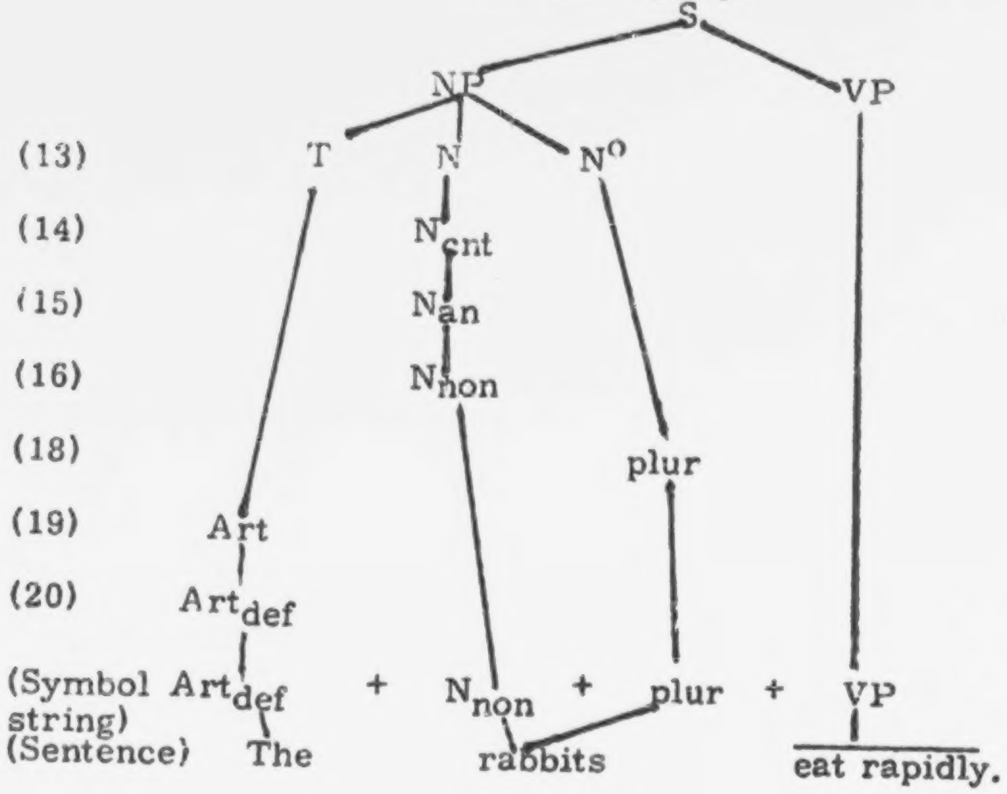
The rule states that articles can be of two types: the definite article and the indefinite articles. We can devise an easy test for remembering which kind of determiner is definite and which ones are indefinite. If the determiner is grammatical in the following slot, it is the definite article: Mr. Smith is _____ very one I meant. If it is not grammatical in this context, the article is indefinite.

Our branching diagrams for sentences now have an additional possibility. The point labeled Art can now be divided into two possible choices: one would be marked Art_{def} and the other $\text{Art}_{\text{indef}}$. If one type of article is chosen, the ~~other~~ type may not be ~~chosen~~. The new diagram follows:


NP
T
N
N°
Art
Art_def
Art_indef

The following sentence shows how the rules would be applied:

Sentence: The rabbits eat rapidly.


S
NP
VP
(13)
T
N
N°
(14)
N_cnt
(15)
N_an
(16)
N_non
(18)
plur
(19)
Art
(20)
Art_def
(Symbol string)
Art_def + N_non + plur + VP
(Sentence)
The
rabbits
eat rapidly.

Exercise 2:

Draw branching diagrams like the one above for each of the following sentences. Your teacher may ask you to develop the verb phrase as well as the noun phrase, or you may develop just the noun phrase, as in the example above.

1. The exercise should have been longer.
2. Some bees had been buzzing angrily.
3. A book can be expensive.
4. Tests may have become useless.
5. The purpose should be clear.
6. An excuse remains unnecessary.
7. Some fellows resigned immediately.
8. A rattlesnake lay there quietly.
9. The rice has been boiling slowly.
10. Buildings can become obsolete.

III. A Little More about Articles

A. The indefinite article *some*

Among the four words we are discussing in this unit, *some* presents a problem for us. Read the following sentences aloud:

1. *Some* water was spilled on the stove.
2. *Some* water has poison in it, but the rest is pure.
3. *Some* boys walked by.
4. *Some* boy walked by.

The *some* in sentences (1)and (3)is different from the *some* in (2) and (4). Pronounce (3) and (4) as you would ordinarily say them. What is the difference? Try it again with another pair of sentences:

5. The teacher called for *some* girls as volunteers.
6. *Some* girls went in, others stayed out.

There is only one reasonable pronunciation for *some* in sentence (6): it should rhyme with *come.* In the sentence "Some boy walked by," it sounds as if *boy* were a mass noun (like the name of a material) unless you pronounce *some* the same as *come*. Try two more sentences that contain *some:*

7. He put *some* plaster on the ceiling.
8. He put *some* boy on the ceiling.

Pronounce the *some* in (7) as you ordinarily would; then pronounce the *some* in (8) exactly the same way. Both of them should rhyme with the last syllable of blossom /bla sə̌m/. This pronunciation should make it sound as if *boy* were the name of a material like plaster, paint, or paste. Clearly, we are dealing with two different kinds of *some* in sentences (1) through (8).

Using the set of phonetic symbols introduced in other units, we could spell the some found in "Some boys walked by" as /sə̆m/. The little mark over the vowel indicates that the word or syllable is not stressed or accented in pronouncing it. On the other hand, the grammatical pronunciation of some in "Some boy walked by" would be spelled /sə́m/. The mark over this pronunciation indicates that it should be stressed, as in the word come. The word some in sentences (2), (4), and (6) sounds like come, and it is not the word we want to concern ourselves with here. Other rules coming later in the grammar will specify exactly what this word is.

B. The lexical entry $\text{Art}_{\text{indef}}$

An important and interesting thing to notice is that a, an, and some (= /sə̆m/) are distributed in such a way in English sentences that where one of them may occur, the other two cannot. Let us examine more carefully how these three words are used.

Exercise 3: Copy the following sentences and fill in each blank with a, an, or some. As you do so, try to decide what kind of nouns each can occur in front of.

1. ________ blood was smeared on the door.
2. My friend brought me _______ atlas.
3. That was my first ride on ________ airplane.
4. I am taking home __________ books.
5. He fell in _________ mud.
6. ___________ boys broke the streetlight.
7. ___________ boy brought the paper.
8. He was staring at _________ crack in the ceiling.
9. ____________ cracks appeared in the sidewalk.
10. ____________ apples were still on the tree.
11. The teacher sat at _________ desk.
12. When we shouted _________ echo bounced back.
13. __________ mush was cooking on the stove.

What can we conclude from this exercise: First of all, a occurs in front of nouns that begin with a consonant sound (a boy, a crack, a desk); an occurs in front of nouns beginning with a vowel sound (an atlas; an echo, an airplane). Second, some (/sə̆m/) never appears in the same place that a and an do. That is, neither a nor an can appear in front of those nouns that can take some:

some blood, but	not a blood
some mud,	not a mud
some mush	not a mush

some books, but	not a books
some boys	not a boys
some cracks	not a cracks
some apples	not a apples

What kinds of nouns are blood, mud, and mush? Since they are grammatical in questions asking "How much ________?" all of them may be classified as mass nouns (N_m). The other nouns, books, boys, cracks and apples, are count nouns followed by plural number: book + plur = books; boy + plur = boys; crack + plur = cracks; apple + plur = apples.

We can conclude from these examples that a and an are not grammatical in front of either mass nouns or plural count nouns. Some, on the other hand, is grammatical in front of both of these. None of the three are interchangeable. Since a and an cannot appear in places where some does appear (and vice versa), we simply say that these are different forms of the same article. In front of N_m and in front of N_{cnt} + plur, this article takes the form some; in front of other nouns, it takes the form a or an depending upon the first sound of the noun.

The name we give to the single article which appears as a, an, or some is $\text{Art}_{\text{indef}}$, meaning indefinite article. How can we show in a rule the contexts in which each of the three forms occur? We want a rule to tell us that when we find an indefinite article it will become an before a singular count noun or some in front of other nouns. We will want another rule to tell us that if the singular count noun happens to begin with a consonant the an will become a. They can be expressed in this way:

(a) $\text{Art}_{\text{indef}}$ ⟶ an /ə̌n/ in the context ________ N_{cnt} + singular
some /sə̌m/ elsewhere

(b) an /n/ ⟶ a /ə̌/ before consonant sounds

Since these rules really tell us something about the pronunciation of the indefinite article in the sentence, they are called pronunciation rules. (Notice that the actual phonetic pronunciation is included in the rule.) These rules operate upon the sentence string, the string in which the lexical choices (words) have already been made. They are really rules which tell us how the words are going to be pronounced. For example, when you find the items past + shall in a sentence string, you know that they will be pronounced should in the final sentence. Past + see will be pronounced saw. You have been applying such rules for some time now as you have developed sentence strings into sentences, but you have not specifically called them pronunciation rules.

Thus you will find the symbol $\text{Art}_{\text{nondef}}$ in the sentence string, but your rules (a) and (b) above tell you to replace it by an, some, or a in the final sentence. Rule (a) tells you to replace $\text{Art}_{\text{indef}}$ by the word an when the next items in the sentence string are N_{cnt} + singular. If something else follows $\text{Art}_{\text{indef}}$ (e.g., N_{mass} or N_{cnt} + plural), you are to replace it with some /sə̌m/. Further, if you replace $\text{Art}_{\text{indef}}$ with an, you must write it as a when the word following it in the sentence begins with a consonant sound (e.g., boy, girl, tack).

C. The lexical entry Art_{def}

Art_{def}, as you know, means definite article. Like the symbol

Art$_{indef}$, this symbol also appears in the sentence string. Therefore, we need one more pronunciation rule to replace the symbol Art$_{def}$ by an actual word that we can say. You have found that the definite article is the. We can show how it is pronounced in the final sentence in this way:

(c) Art$_{def}$ $\longrightarrow$ the /ðə/, or optionally /ðī/ before vowels

Thus whenever you find Art$_{def}$ in a sentence string, replace it with the word the in the final sentence. The word the is usually pronounced /ðə/, but many people say it as /ðī/ (like the word thee) when the word following it begins with a vowel sound (e.g., apple, egg, ox).

V. Conclusion

As our rules are now written, they are fairly effective in producing grammatical English sentences. For instance, we are now prevented from producing ungrammatical sentences like the following: *"A water is in the pitcher" or *"An elephants roared loudly." A pronunciation rule for Art$_{indef}$ prevents occurrences of a or an in front of nouns like water (N_{mass}) and elephants (N_{cnt} + plur). If Art$_{def}$ is chosen, then the word the could appear in front of these nouns (the water, the elephants). If you wish to specify particular water or particular elephants, you must use the, the definite article; if you do not, you may use the indefinite article some.

What are we to do about those nouns that pass the test for mass nouns (How much _____?) but are grammatical with a or an? A is perfectly grammatical in the sentence "This is a wheat that needs careful cultivation." Such sentences would seem to prove that the rule for pronouncing Art$_{indef}$ is not correctly formed, since it prohibits a from occurring in front of mass nouns like wheat. The answer is simple. In such instances, a deletion has taken place. A deletion is said to have taken place when one or more items in a sentence have been taken out or suppressed. For example, when a sentence with a transitive verb (V_{tr}) is made passive, the agent (or doer) of the action may be deleted in the final sentence: The bullet hit the target. $\Longrightarrow$ The target was hit (by the bullet). We may include the words found within the parentheses or we may delete them. In sentences like "This is a wheat that needs careful cultivation," a phrase such as kind of, sort of, type of, species of, etc. has been deleted from between the word is and the mass noun wheat. In other words, a phrase like a species of rice may become a rice by a deletion of the words species of.

(22) This is a kind of cereal that sticks to your ribs. $\Longrightarrow$
This is a cereal that sticks to your ribs.
(23) I want a type of gold that has a dull finish. $\Longrightarrow$
I want a gold that has a dull finish.

On the other hand, when we casually use a singular count noun as a mass noun, the article a or an is omitted: "That is a lot of car." Perhaps such an expression owes its effectiveness to the fact that it really is slightly ungrammatical. Most of us would not consider car to be a noun that could fit into the context "How much _______ ?"

You must recognize that we have not yet discussed many different structures which must eventually be identified as determiners. You have written rules that account for only the most common determiners: the definite article the, and the indefinite articles a, an, and some. Words like my, all, any, each, and seven must also be accounted for in our rules. For the present, however, you can use the rules that have been written, even though you know that they are not complete.

Exercise 4:

A. Indicate which articles are present in the following sentences. Write the abbreviation Art_{def} or $\text{Art}_{\text{indef}}$ below each article in the sentence. In those sentences in which nouns occur with no determiner in front of them, do as you have been instructed to do previously: use the symbol $\emptyset$ to indicate that the set of determiners chosen before this noun is the empty set.

Example: The kittens drank milk from a saucer.
Art_{def} $\emptyset$ $\text{Art}_{\text{indef}}$

1. A cyclone tore the roofs from some houses.
2. The girls in class like dances better than the boys do.
3. The sink held some water and leftovers from the meal.
4. Some rice was thrown into the car by a guest.
5. An axle broke and the car rolled into a ditch.

B. Copy the following sentences and replace the articles called for with the proper word.

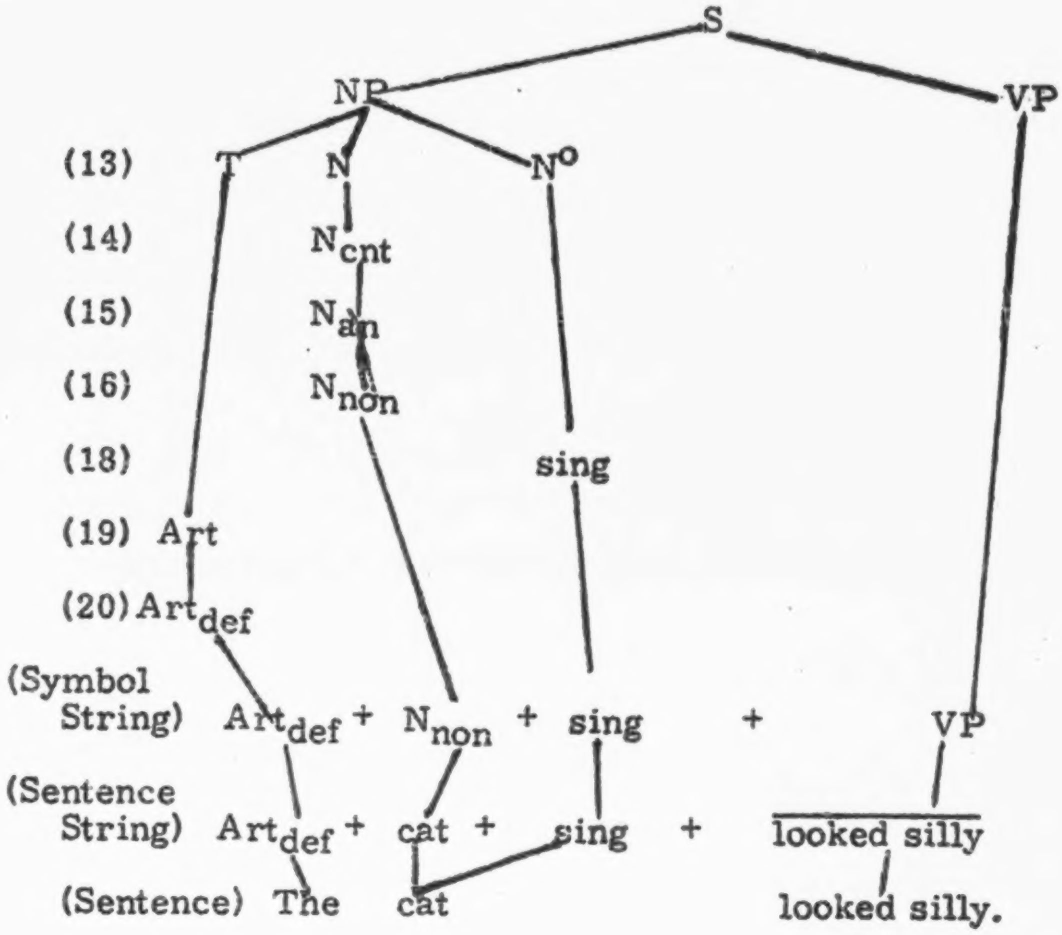
Example:
I found Art_{def} book on (Art_{def}) shelf. I found the book on the shelf.

1. (Art_{def}) librarian gave me ($\text{Art}_{\text{indef}}$) card and I took ($\text{Art}_{\text{def}}$) book.
2. It was ($\text{Art}_{\text{indef}}$) book about dinosaurs.
3. (Art_{def}) cook brought us ($\text{Art}_{\text{indef}}$ apples.
4. ($\text{Art}_{\text{indef}}$) apple ($\text{Art}_{\text{indef}}$) day keeps ($\text{Art}_{\text{def}}$) doctor away.
5. (Art_{def}) voters rejected (Art_{def}) ballot measure.
6. ($\text{Art}_{\text{indef}}$) flowers were left on ($\text{Art}_{\text{def}}$) table.
7. I had ($\text{Art}_{\text{indef}}$) money left.
8. ($\text{Art}_{\text{indef}}$) avalanche destroyed ($\text{Art}_{\text{def}}$) village.
9. ($\text{Art}_{\text{indef}}$) officers were standing on (Art_{def}) corner.
10. (Art_{def}) school is giving ($\text{Art}_{\text{indef}}$) award.

Exercise 5:

Draw branching diagrams for the following sentences using only those rules which develop the noun phrase. Remember to apply each rule that is applicable in the proper numerical order.

For example: The cat looked silly.


S
NP
VP
(13) T N N°
(14) N_cnt
(15) N_an
(16) N_non
(18) sing
(19) Art
(20) Art_def
(Symbol String) Art_def + N_non + sing + VP
(Sentence String) Art_def + cat + sing + looked silly
(Sentence) The cat looked silly.

A.

1. Some boys walked by.
2. The trenches are dirty and wet.
3. Some boys built a fire there.
4. An accident could happen.
5. A friend stopped in yesterday.

B.

1. The ladder is here.
2. Some men were brought in.
3. An accident can always happen.
4. A truth is usually self-evident.
5. The trailers were uncomfortable.
6. The man should find the money.
7. Some boys started some trouble.
8. Some soup might help.
9. The evidence should appear conclusive.
10. The lamps should be practical.

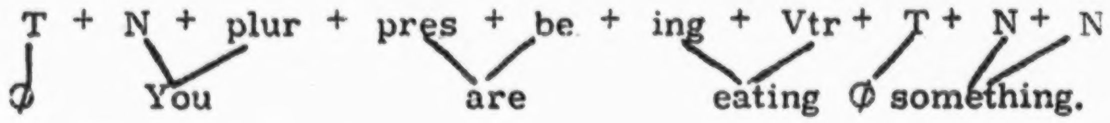
Cumulative Review:

Make detailed branching diagrams for the following sentences.

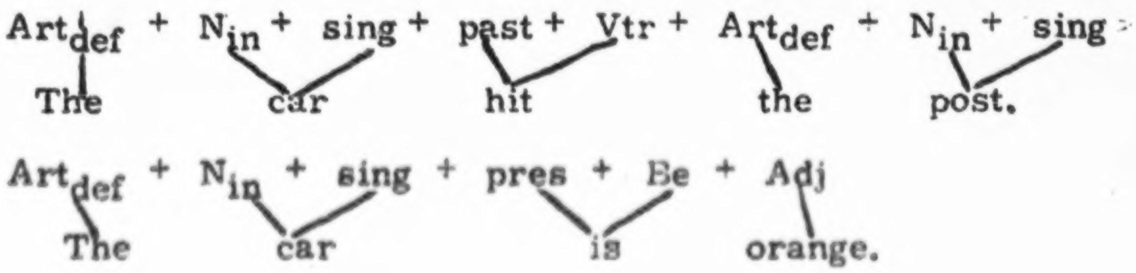
1. Sunshine was pouring into the room.
2. The class will put on a skit tonight.
3. Some cocoa would taste good.
4. The runner became tired easily.
5. The climber has been clinging to the cliff all night.
6. The sheriff is at the scene.
7. A traveler has brought us the information.
8. The rangers had been having difficulties.
9. Flattery will get you nowhere.

B. Write the underlying kernel sentences and symbol strings for the following:

Examples: 1. What are you eating?


T + N + plur + pres + be + ing + Vtr + T + N + N
Ø
You
are
eating
Ø
something.

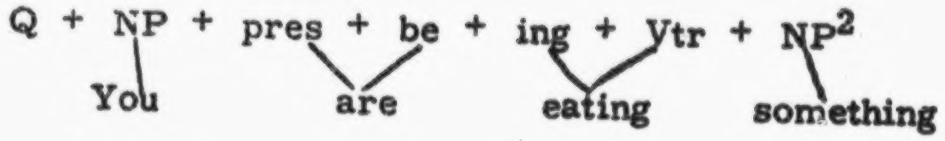
2. The orange car hit the post.


Art$_{def}$ + N$_{in}$ + sing + past + Vtr + Art$_{def}$ + N$_{in}$ + sing +
The
car
hit
the
post.
Art$_{def}$ + N$_{in}$ + sing + pres + Be + Adj
The
car
is
orange.

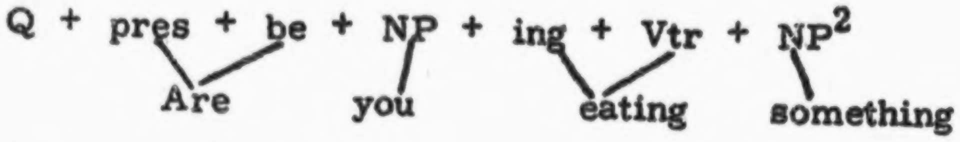
1. Who has been sleeping in my bed?
2. Is Jerry taking the new math this year?
3. My friend the cop asked me a question.
4. Math and science are required in our school.
5. Where have you put the keys?
6. Black bugs are crawling into the woodwork.
7. The car on the street has been painted recently.
8. We have called the police and received their permission.
9. Bill's racket belongs to his roommate.
10. The old costumes are hanging in Mary's closet.

C. Show the transformations the underlying kernel sentences which you wrote in B must go through to become the sentences listed. For this part of the exercise use NP rather than the more detailed strings.

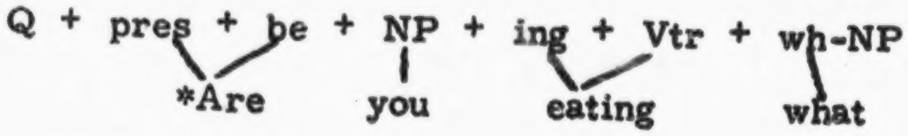
Example:


Q + NP + pres + be + ing + Vtr + NP^2
You
are
eating
something

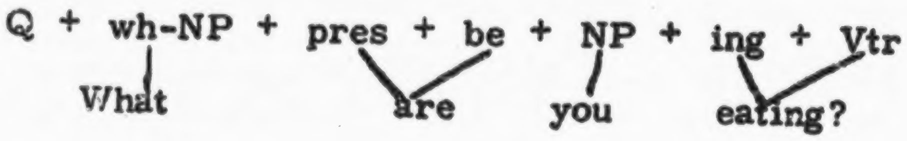
by T_Q


Q + pres + be + NP + ing + Vtr + NP^2
Are
you
eating
something

by wh-attachment


Q + pres + be + NP + ing + Vtr + wh-NP
*Are
you
eating
what

by T_{wh}


Q + wh-NP + pres + be + NP + ing + Vtr
What
are
you
eating?

MORE ABOUT QUESTIONS

A grammar of a language is a set of rules (or statements) which describe a language. If the rules are written so that each rule depends upon a rule that has gone before, and if one can end up with sentences of the language by following the rules through in order, then the grammar is a *generative grammar*. This is the kind of grammar being developed in this course. You probably remember exercises in which you "generated" sentences by applying the phrase structure rules. You may want to try it again from time to time. It is a good way to test the rules, because if the rules aren't accurate descriptions of the language, or if there aren't enough rules, they won't always produce grammatical sentences.

If we could write enough rules and make them precise enough, our grammar would always produce the grammatical sentences of our language --the kind that as native speakers of the language we use without thinking. Although we can probably never write all the rules which would be necessary to account for all the sentences we can speak, our goal each year is to make our rules more precise and to try to make them apply to more and more sentences. As we become more precise in our rules, and as we discover more relations between various parts of the sentence and between kinds of sentences, the more we will understand about our language and how it is produced.

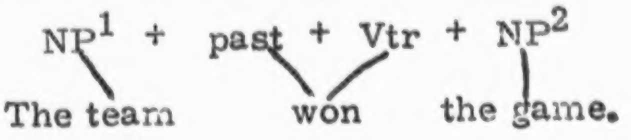
Yes-or-No Questions

Although we have developed some rules to show how questions are formed, we have not yet accounted for all there is to know about questions. For instance, although we have rules which show how questions are formed, we have no rule to show why they are formed. In this unit we will try to learn something more about questions and to make our rules about them more precise. Look at the following pair of sentences and decide how they differ.

The team won the game.
Did the team win the game?

You know that the second sentence is a question. What kind of a question is it? And you know also that questions are formed by transformations of basic symbol strings. What is the symbol string which has been transformed to make this question?

The string of symbols for *The team won the game* is



You have learned that the same string of symbols underlies *Did the team* win the game? but that it has been transformed by a question transformation:

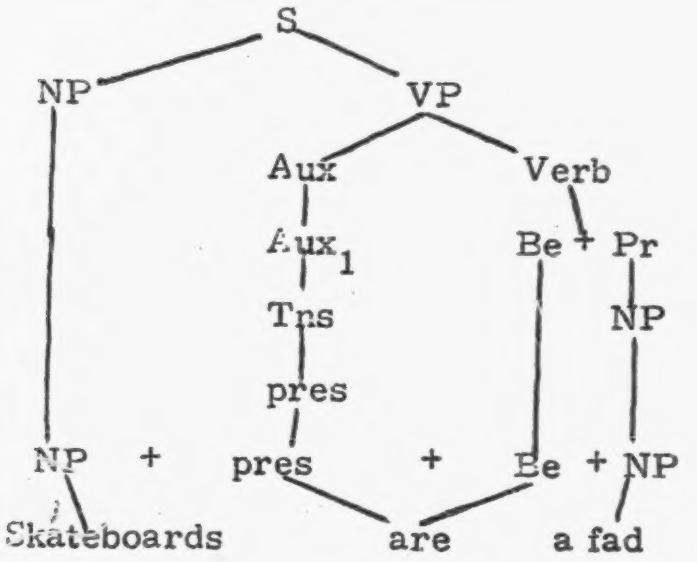
$$NP^1 + past + Vtr + NP^2 \Longrightarrow$$

$$past + do + NP^1 + Vtr + NP^2$$

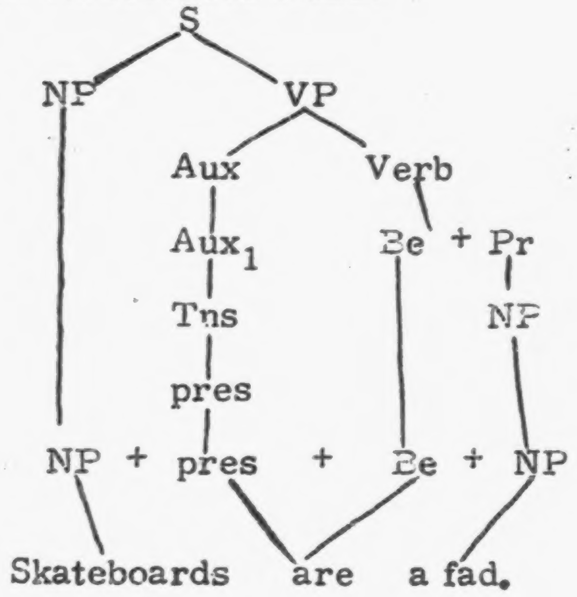
Did the team win the game?

As far as you know the Phrase Structure rules operate in exactly the same way to produce both sentences. This means that the two sentences have the same underlying structure. But is this true? If you were asked to diagram the following sentences with the knowledge you have now, you would probably construct the same underlying diagram for both.

Skateboards are a fad.



Are skateboards a fad?



Then for the second you would apply the yes-or-no question transformation.

Skateboards are a fad. ⟹ Are skateboards a fad?

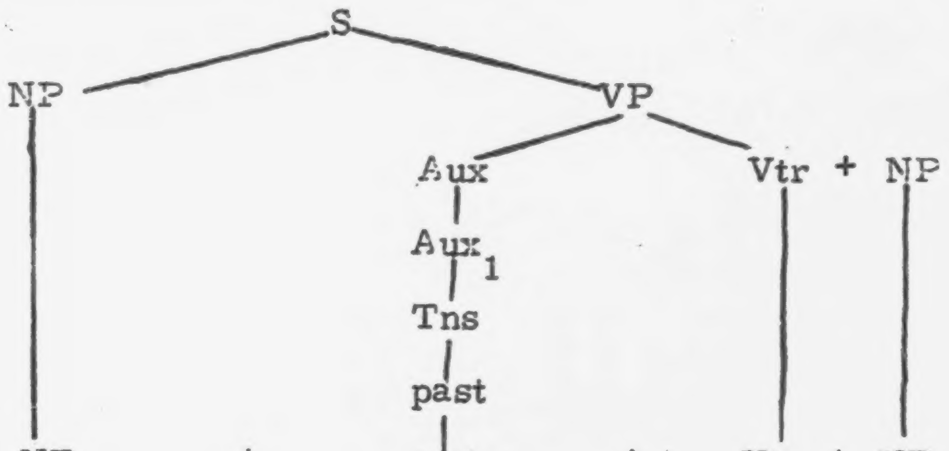
Such an explanation, of course, accounts for the very close relation which there seems to be between the two sentences. But the Phrase Structure rules do not explain the difference between the two. They do not tell us why NP_1 + Aux + Be+NP becomes a declarative sentence in one case and a question in another.

We have assumed that the transformation into a question was an optional operation which we could apply if we wanted to. There is nothing in the string to tell you to perform it. But if we could find a way to show in our rules whether or not the question transformation should be applied we would then be showing why. If we could insert in the Phrase Structure rules underlying the string a Question element to indicate that it should go through the question transformation, this element could then trigger the transformation. In other words, the question direction could be indicated when the sentence was being generated. In this way we could let the

Phrase Structure account for both the similarity and the difference in declaratives and questions. They would be alike in every way except one. The question would have an element to indicate that it should be transformed into a question. Since this Question element would affect the sentence as a whole, it should be in the string from the beginning. The first phrase structure rule, then, is the logical place to show that a sentence has this choice. We will, therefore, add the symbol (Q) to Rule 1 to show that Sentence can become a question. So the revised rule will read

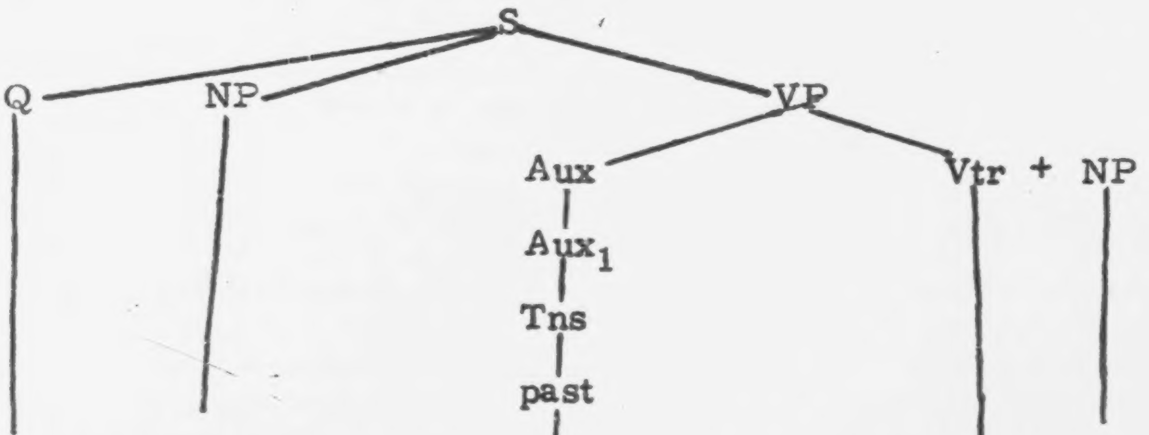
Rule (1) Sentence ⟶ (Q) NP + VP

The parentheses indicate, of course, that at the beginning the choice is optional. We choose at that point whether we are going to make a sentence a question or not. Now let's see how this new element will fit into a diagram. If, when we apply Rule (1) we do not choose (Q) the diagram will look like the diagrams which you have been making. For example the diagram for The team won the game would be:



And the symbol string would be: NP + past + Vtr + NP

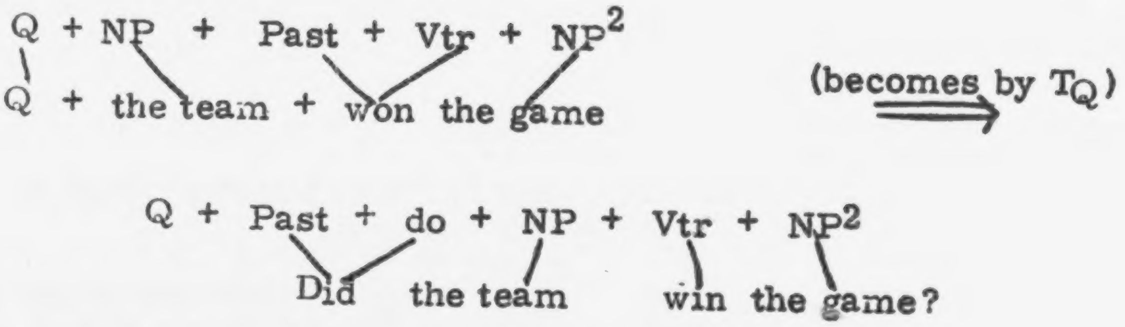
But if we choose the element (Q) we will have to show it in the diagram in this way:



Q + NP + past + Vtr + NP

What does the Q in the sentence string mean? It simply means that the string must go through the question transformation because Q has been chosen in Rule 1. The Q triggers the transformation. This transformation is the yes-or-no transformation which you are already familiar with.

It is called T_Q.


Q + NP + Past + Vtr + NP²
Q + the team + won the game
(becomes by T_Q)
Q + Past + do + NP + Vtr + NP²
Did the team win the game?

Now you can see that the underlying strings for the two sentences

The team won the game.
Did the team win the game?

are the same except that the second one has a Q. In fact, the underlying string for any question is like the string for a declarative sentence with Q as its first element.

Review of yes-or-no transformations

Let us review T_Q (the yes-or-no question transformation.) You remember that it is the basis for all other question transformations.

Exercise:
Write the symbol strings for the following sentences. Then turn them into yes-or-no questions and write the symbol strings for the questions.

A.
1. The birds will fly north soon.
2. I can give the report today.
3. The boy should lock the bicycle.
4. I must pass the exam.
5. They would forget.

B.
1. Terry has given blood.
2. The chimps have learned a language quickly.
3. A plane has landed in the driveway.
4. Some people have built shelters in basements.
5. The superintendent had been ill.

C.
1. The fish is dodging the hook.
2. Fred was a girl.
3. The children were walking in the cement.
4. I am going with you.
5. They are flying to Hawaii.

D.
1. Earwigs ate the shrubbery.
2. A leprechaun came out of the hole.
3. She baked a pizza.
4. Joel drives dangerously.
5. The skunk discouraged him.

In the sentences in group A above, which elements changed places with the subject NP to form the question?

In group B, which elements changed places?

In group C, which elements were involved? Does it matter whether the Be is an auxiliary Be or the main Verb of the sentence?

In the sentences in Group D, what element moves to the front of the sentence? What must be added to form the yes-or-no question for this group? Why?

The rule for T_Q has been symbolized in the following way. Try to explain why it was written in this way and what it means.

$$T_Q \quad NP + Tns + \left\{\begin{bmatrix} M \\ have \\ be \\ \underline{\qquad} \end{bmatrix}\right\} + \ldots\ldots \Longrightarrow$$

$$Tns + \left\{\begin{bmatrix} M \\ have \\ be \\ \underline{\qquad} \end{bmatrix}\right\} + NP + \ldots$$

You may remember that if neither M, have, or be occur in a sentence string, then Tns moves to the front alone. This produces Tns + ______ + NP in the transformed string. The empty space (______) indicates that when Tns moves up ahead of NP there is nothing for it to attach to, since it can't attach to NP. Therefore, it becomes necessary to add do for Tns to attach to. We will eventually want to write a rule for this operation, because it is a separate step, but for now, we will just add the do when we are performing the transformation.

Now that we have placed Q in the underlying kernel sentence string, it will be necessary to reformulate our rule for T_Q so that Q can be included. With the addition of Q the revised transformation will look like this:

$$T \quad Q + NP + Tns + \left\{\begin{bmatrix} M \\ have \\ be \\ \underline{\qquad} \end{bmatrix}\right\} + \ldots \Longrightarrow$$

$$Q + Tns + \left\{\begin{bmatrix} M \\ have \\ be \\ \underline{\qquad} \end{bmatrix}\right\} + NP \ldots$$

(Note: When [ ] are used in a rule like T_Q they mean that the items within one set of brackets line up with the corresponding items in the other set. In other words, if we have M in the string on the left of the $\Longrightarrow$, then the transformed string on the right will also have M. If the string includes have as the first word after Tns then the transformed string will also include have as the first word after Tns. The bracket [ ] is, thus, a very useful symbol. Like all the symbols we use, it is a very simple way to show a fact that would take many words to explain.)

We can conclude that when we see a yes-or-no question it has an underlying symbol string like the string for its corresponding declarative sentence, but that it has a Q at the beginning which means that the string must go through T_Q (the yes-or-no transformation).

Exercise:
Write the underlying symbol strings for the following sentences. For the questions show how the T_Q operates on the underlying string to produce the question.

Example: The bird sang all night. (NP + past + Vtr + Tm)

Did the bird sing all night? (Q + NP + past + Vin + Tm) $\xRightarrow{T_Q}$

past + do + NP + Vin + Tm
Did the bird sing all night?

A. 1. The boys are sparring in the gym.
Are the boys sparring in the gym?

2. Jeannie dyed her hair.
Did Jeannie dye her hair?

3. The advisor has called a meeting.
Has the advisor called a meeting?

4. You will be sorry.
Will you be sorry?

5. The elephants are eating peanuts.
Are the elephants eating peanuts?

B. 1. Will you pass the potatoes?
2. The climber fell into the crevice.
3. Did they reach him last night?
4. He has seen the report.
5. David composes music easily.
6. Has the band learned the selection?
7. Should we decorate the hall?

C. Write possible sentences for the following underlying symbol strings, showing how Q triggers a transformation.

Examples: 1. NP + pres + M + sing + Man
The choir will sing quietly.

2. Q + NP + pres + M + sing + Man $\xrightarrow{T_Q}$
Q + pres + M + NP + sing + Man
Will the choir sing quietly?

1. NP + NP + past + write + NP
2. Q + NP + past + write + NP
3. NP + pres + have + en + Vlnk + Pr
4. Q + NP + pres + have + en + Vlnk + Pr
5. Q + NP + past + be + ing + Vtr + NP + Man
6. Q + NP + past + M + have + en + Vin + Man
7. NP + pres + Vmid + NP
8. NP + pres + have + en + Be + Pr

Review of Other Questions

The symbol Q in a sentence string tells us that the string must go through a transformation (T_Q) to produce a yes-or-no question. This kind of question is really a sentence question. It asks if the whole sentence is or is not true and Q is what makes the difference between the declarative sentence and the question. The difference between

The boy eats goldfish secretly in the kitchen at night.

and

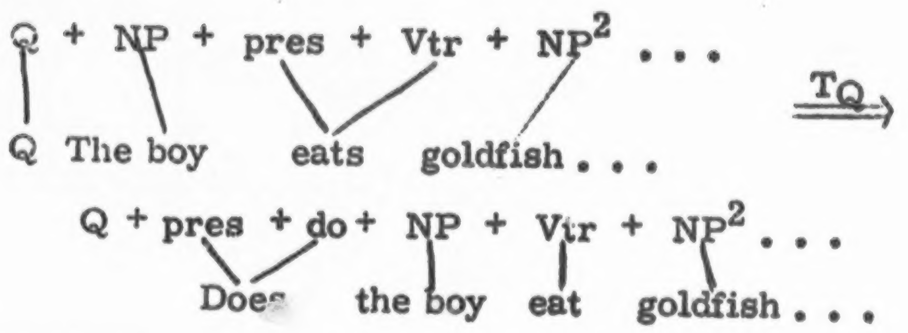
Does the boy eat goldfish secretly in the kitchen at night?

is Q.

But, as you know, there are other kinds of questions. We can say

1. What does the boy eat secretly in the kitchen at night?
2. When does the boy eat goldfish secretly in the kitchen?
3. Where does the boy eat goldfish secretly at night?
4. How does the boy eat goldfish in the kitchen at night?
5. Who eats goldfish secretly in the kitchen at night?

And your intuition tells you that all of these questions are somehow related. How are they related? Notice that with the exception of the last one (which we will discuss a little later) they all include ". . . does the boy eat . . ." What transformation produced . . . does the boy eat . . . ? The first thing to remember, then, is that all of the questions are transforms of the same underlying string and have all gone through T_Q. This is how they are alike.


Q + NP + pres + Vtr + NP2 . . .
Q The boy eats goldfish . . .
TQ
Q + pres + do + NP + Vtr + NP2 . . .
Does the boy eat goldfish . . .

How do we account for their difference? The first thing we notice is that each one begins with a different question word, and in each one something has been left out of the original sentence.

In 1, what appears and goldfish has been left out.

In 2, when appears. What has been left out?

What appears and what has been left out of 3, 4, and 5?

Can we assume that the question word appearing at the beginning of each of the five sentences is a replacement for the word left out? How has this happened?

You may remember that the symbol which means that a question word is going to appear in the place of a particular sentence element is wh. By attaching this symbol (known as wh-attachment) to an element in the underlying string, we can show what element is going to become a question word. When an element has wh attached to it, it becomes a question word in the sentence. Thus wh-NP^2 becomes whom, or what. We say that wh-NP^2 is pronounced whom or what. The rule which gives us this information is called a pronunciation rule. Such rules tell us how the sentence string becomes the sentence.

Thus:

wh-NP^2 ⟶ whom/what
wh-Tm ⟶ when
wh-Loc ⟶ where
wh-Man ⟶ how
wh-NP^1 ⟶ who/what

Practice in recognizing kinds of questions:

The kind of answer you can give to a question will help you decide what kind of question it is. Yes-or-no questions can be answered by yes-or-no. Those which question a single element in the sentence will have one of the question words (what, who, whom, how, where, when). It will be useful to remember how these words are derived for that will be a clue to what sentence element they replace. That is, since where is derived from wh-Loc you know that where replaces a Loc in the sentence string. What do the other question words replace?

Exercise 3:
Change the following sentences into questions by substituting question words for the elements underlined.

Example: Joe is singing in the shower.
Who is singing in the shower?

The cat was sleeping in the attic.
Where was the cat sleeping?

1. Martha locked the door quickly.
2. Martha locked the door quickly.
3. She ran upstairs.
4. Bill called the police.
5. Bill called the police at eight o'clock.
6. The bulldozers began to arrive early.
7. The bulldozers are moving the hill.
8. The contractor has a bulldozer.
9. The workmen have arrived at the yard.
10. They will remove the bomb carefully.

Exercise 4:
Make up answers to the following questions. Indicate whether each is a yes-or-no question or a wh question. In the answers to the wh questions, underline the element which you have supplied for the answer and indicate what element it is in the sentence.

Examples: Are you going to town?
Yes, I am going to town. (Yes-or-no question)

Who is providing refreshments:
The teacher is providing refreshments
--(subject NP)

1. What is the cook baking?
2. Who is your best friend?
3. When is Helen going to camp?
4. How does the Corvair run?
5. Who turned off the lights?
6. Whom have you contacted?
7. How are the Dodgers doing?
8. What was crawling down the hall?
9. What will the orchestra be playing?
10. What are the boys bringing?
11. Who has left thumbtacks on the chair?
12. Where have you put your glasses?
13. What do the penguins eat?
14. When will the report be due?
15. Where do the Beatles live?

Now let us return to the five questions with which we started this section. (p. 7) Remember that we have found that each has gone through T_C. What else has happened to them? In 1, wh has been attached to NP^2. It becomes what in the sentence. This is the wh-attachment transformation.

# pres + ____ NP + Vtr + NP^2 . . . $\Longrightarrow$

Does the boy eat goldfish . . .

pres + ____ NP + Vtr + Wh-NP^2 . . .

Does the boy eat what. . . .

In 2, wh is attached to Tm (at night).

pres + ____ NP + Vtr + NP^2 . . . Tm $\Longrightarrow$

Does the boy eat goldfish . . . at night

pres + ____ NP + Vtr + NP^2 . . . wh-Tm

Does the boy eat goldfish. . . when.

In 3, wh is attached to Loc (in the kitchen).

pres + ____ NP + Vtr + NP^2 . . . Loc. . . $\Longrightarrow$

Does the boy eat goldfish. . in the kitchen . . .

pres + ____ NP + Vtr + NP^2 . . . wh-Loc. .

Does the boy eat goldfish. . . where . .

In 4, wh is attached to Man (secretly).

pres + ____ NP + Vtr + NP^2 + Man. . . $\Longrightarrow$

Does the boy eat goldfish secretly. . .

pres + ____ NP + Vtr + NP^2 + wh-Man . . .

Does the boy eat goldfish how . . .

In 5, wh is attached to NP^1 (The boy).

pres + ____ NP + Vtr + NP^2 . . . $\Longrightarrow$

Does the boy eat goldfish

pres + ____ wh-NP + Vtr + NP^2 . . .

Does who eat goldfish. . .

So, when NP^2, Tm, Loc, Man, NP^1 occur in an underlying string which has been through T_Q they can each have wh attached to them. This indicates that they will become a question word. Earlier we symbolized this transformation by this rule:

#(Notice that in each of these five sentences it is necessary to supply do when the question transformation has occurred.)

$$T_{\text{wh-attachment}} \quad \ldots \left\{\begin{matrix} NP^2 \\ Tm \\ Loc \\ Man \\ NP^1 \end{matrix}\right\} \ldots \Longrightarrow \ldots wh\text{-}\left\{\begin{matrix} NP^2 \\ Tm \\ Loc \\ Man \\ NP^1 \end{matrix}\right\} \ldots$$

Putting all of the symbols in braces in this way makes it possible to write one rule instead of five. What does (. . .) stand for in the rule? With the knowledge we have of the use of $[\quad]$ how can we improve this rule to make sure that if NP^2 is the element being questioned, it will become wh-NP^2 in the transformation? And that Tm will become wh-Tm? Brackets, of course, mean just that. They make sure the item on the left selects its corresponding item on the right. If we add them to the rule, it will look like this:

$$\ldots \left\{\begin{bmatrix} NP^2 \\ Tm \\ Loc \\ Man \\ NP^1 \end{bmatrix}\right\} \ldots \Longrightarrow \ldots wh\text{-} \left\{\begin{bmatrix} NP^2 \\ Tm \\ Loc \\ Man \\ NP^1 \end{bmatrix}\right\} \ldots$$

There is one other way in which we can make this rule more accurate. This transformation is restricted to strings which have gone through T_Q. What is the symbol which means that a string must go through T_Q? By including Q in our rule, then, we will be saying very simply that this transformation operates only on this particular kind of string--one that goes through T_Q. So the final statement of the rule should be:

$$T_{\text{wh-attachment}} \quad \boxed{Q \ldots \left\{\begin{bmatrix} NP^2 \\ Tm \\ Loc \\ Man \\ NP^1 \end{bmatrix}\right\} \ldots \Longrightarrow Q \ldots wh\text{-} \left\{\begin{bmatrix} NP^2 \\ Tm \\ Loc \\ Man \\ NP^1 \end{bmatrix}\right\}}$$

The wh-attachment transformation tells us how a question word gets into the sentence. But it produces strings like the following:

Q + pres + ____ + NP + Vtr + wh-NP^2
*Does the boy eat what . . . ?

Q + pres + ____ + NP + Vtr + NP^2 . . . wh-Tm
*Does the boy eat goldfish . . . when?

We wouldn't accept these sentences as grammatical. In questions which are grammatical, where does the question word appear? We need, then, an additional transformation to move the wh word to the front of the sentence. This is the transformation we have called $T_{\underline{wh}}$ because it involves moving the wh word. If we let the usual sign (. . .) indicate the part of the sentence string which comes before the wh word we can show this transformation in the following way. We will, of course, include Q because it is the thing that tells us that this is a question string.

$$T_{wh}\quad \boxed{Q\ldots wh\text{-}\left\{\begin{bmatrix}NP^2\\Tm\\Loc\\Man\\NP^1\end{bmatrix}\right\} \Longrightarrow Q\ \ wh\text{-}\left\{\begin{bmatrix}NP^2\\Tm\\Loc\\Man\\NP^1\end{bmatrix}\right\}+\ldots}$$

This rule tells us that when we have a string like

Q + pres + ___ + NP + Vtr + NP^2 . . . wh-Tm $\Longrightarrow$
*Does the boy eat goldfish . . . when

it must become Q + wh-Tm + pres + ___ + NP + Vtr + NP^2
When does the boy eat the goldfish?

Sentence 5 in our example sentences needs a bit of explanation. The sentence we are using as an example is one in which Tns is not followed by M, have, or be. The verb itself carries the tense (pres + eat eats) You may remember that T_Q tells us that in such cases Tns moves to the front of the sentence by itself and we add do to make the sentence grammatical. (The boy eats goldfish $\Longrightarrow$ Does the boy eat goldfish.) When we attach wh to NP^2, Tm, Loc, and Man and bring them to the front of the sentence this structure remains just as it is:

What does the boy eat. . .
When does the boy eat . . .
Where does the boy eat . . .
How does the boy eat . . .

But when we bring Who to the front we get "Who does eat goldfish. . ." which is not the way we ask a simple subject question.

You may remember that if we do not add do until after the T_{wh} transformation which draws the who to the front of the sentence, our problem is solved. When the who goes to the front pres is again left next to the verb and we get

pres + wh - NP + eat + goldfish $\overset{T_{wh}}{\Longrightarrow}$

wh-NP + pres + eat + goldfish
Who eats goldfish . . .

So it is important to remember to add do as the final step in the question transformation.

Summing up

Wh attached to any element in a symbol string which also contains Q tells us that that particular element is going to appear as a question word at the beginning of the sentence. In other words, wh calls for a particular kind of transformation and a wh-question is one that has gone through this kind. What are the steps of this transformation?

First, the symbol Q at the beginning of a sentence string tells us that the string must go through the yes-or-no question transformation (T_Q)

Q + NP + pres + have + en + Vtr + NP^2
Q + Freddy has caught a snake

This transformation calls for moving tense and M, have, or be or moving tense and adding do to the front of the sentence.

Q + pres + have + NP + en + Vtr + NP^2
Has Freddy caught a snake?

Second, if the symbol string also contains a wh-attachment, it must then go through another transformation which first substitutes a question word for the element with wh, and second, moves it to the front of the sentence.

For example: "What has Freddy caught" would be produced by these steps:

Q + NP + pres + have + en + Vtr + wh-NP^2 $\xRightarrow{T_Q}$
Freddy has caught a snake

Q + pres + have + NP + en + Vtr + NP^2 $\xRightarrow{T_{wh}\text{-attachment}}$
Has Freddy caught a snake?

Q + pres + have + NP + en + Vtr + wh-NP^2 $\xRightarrow{T_{wh}}$
Has Freddy caught what?

Q + wh-NP^2 + pres + have + NP + en + Vtr
What has Freddy caught?

Exercise 5:
Perform whatever transformations are called for by the symbols in the following sentence strings, and then write the question which will result.

Examples:

1. Q + wh-NP + past + break + the window + last night $\xRightarrow{T_Q}$

Q + past + wh + NP + break + the window + last night. $\xRightarrow{T_{wh}}$

Q + wh-NP + past + break + the window + last night.

Who broke the window last night?

2. Q + The boy + past + break + wh-NP^2 + last night. $\xRightarrow{T_Q}$

Q + past + _____ + the boy + break + wh-NP^2 + last night. $\xRightarrow{T}$

Q + wh-NP^2 + past + do + the boy + break + last night.

What did the boy break last night.

1. Q + the boy + past + steer + the boat + skillfully
2. Q + the + boy + past + steer + wh-NP^2 + skillfully.
3. Q + The monk + plural + past + engrave + the manuscript + wh-
4. Q + wh-NP + pres + be + ing + whistle + in the park.
5. Q + The bird + sing + be + ing + whistle + wh-Loc
6. Q + wh-NP + pres + have + en + arrive + on time.
7. Q + The grandparents + have + en + arrive + wh-Tm.
8. Q + The move + sing + past + amuse + wh-NP^2

Exercise 6:

Write the underlying string for the following and show what transformations each has gone through to produce these questions.

Example: What have you cooked today?

Q + NP^1 + have + en + cook + wh-NP^2 + Tm $\xRightarrow{(T_Q)}$

You have cooked what today.

Q + pres + have + NP^1 + en + cook + wh-NP^2 + Tm $\xRightarrow{(T}$

Have you cooked what today.

Q + wh-NP^2 + pres + have + NP^1 + en + cook + Tm

What have you cooked today?

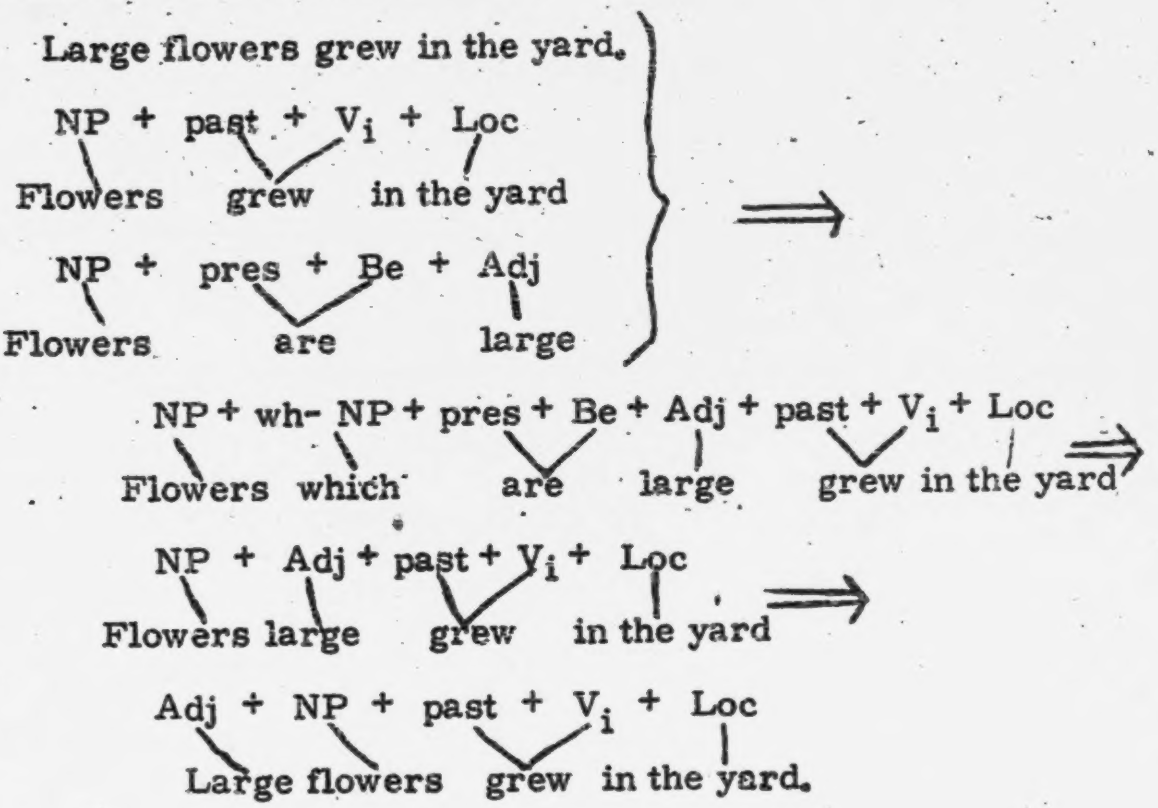
1. Has the boy finished the model?
2. What has the boy finished?
3. When will we go to town?
4. What did Mary find in the basket?
5. Who is running around the track?
6. Whom has the girl invited?
7. Where is the chalk?

8. How does Joyce write?
9. Who has been using this typewriter?
10. Will the government refund your money?

Cumulative review:

Write the underlying kernels and symbol strings for the following sentences and show what transformations produced them.

Example: Large flowers grew in the yard.


NP + past + V_i + Loc
Flowers grew in the yard
NP + pres + Be + Adj
Flowers are large
⟹
NP + wh- NP + pres + Be + Adj + past + V_i + Loc
Flowers which are large grew in the yard
⟹
NP + Adj + past + V_i + Loc
Flowers large grew in the yard
⟹
Adj + NP + past + V_i + Loc
Large flowers grew in the yard.

1. The new teacher has given the class a hard assignment.
2. Cherries and peaches make good pies.
3. The girl who finished first is a senior.
4. Who caught the bride's bouquet?
5. When has the yellow house been painted?

THE NEGATIVE

Some of you may have noticed that the sentences you have been analyzing so far in your study of grammar have been sentences like

The students have been studying.
The cat is purring.
The meal was good.
The boat has hit the dock.
I found bats in the attic.
You paid attention.

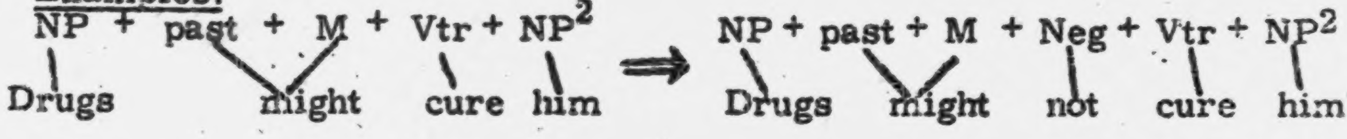
You have not analyzed sentences like

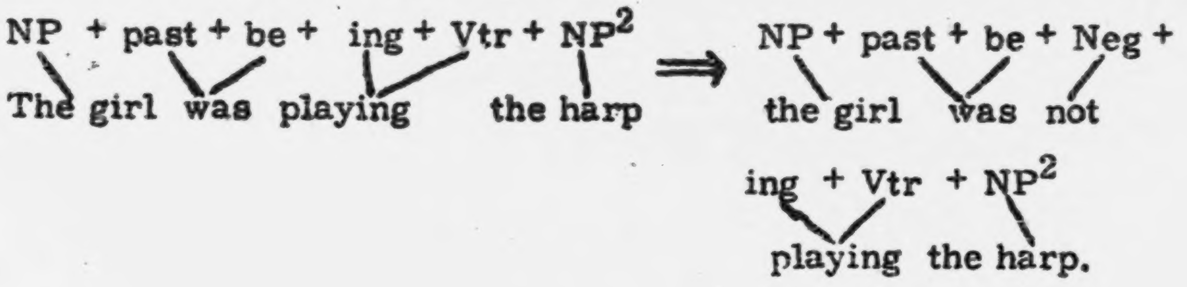
The students have not been studying.
The cat is not purring.
The meal was not good.
The boat has not hit the dock.
I did not find bats in the attic.
You did not pay attention.

What is the difference between the two groups of sentences? The second group of sentences is said to be negative. What makes a sentence negative? The sentences in the second group above contain the word not. The addition of some form of not is the simplest way to make a sentence negative. But can not be added just any place in the sentence, or is its position important? The purpose of this unit is to define the position of not in sentences and to try to find a rule which will explain how sentences become negative.

Exercise:
Insert the word not into each of these sentences without changing the original sentence in any other way. Then construct symbol strings for each pair of sentences. (Use Neg as the symbol for the negative word that you have inserted.) Notice the position of not in the second example. Why is it placed before ing in the negative string? In what other transformations do we separate ing from be and en from have?

Examples:


NP + past + M + Vtr + NP²
Drugs might cure him
⟹
NP + past + M + Neg + Vtr + NP²
Drugs might not cure him


NP + past + be + ing + Vtr + NP²
The girl was playing the harp
⟹
NP + past + be + Neg +
the girl was not
ing + Vtr + NP²
playing the harp.

1. Tom is going.
2. The driver could explain the accident.
3. I had made an A in history.

4. Basil would meet the requirements.
5. This has solved our problem.
6. The boys will go to the game.
7. Alice was attending the play.

Which of the negative sentences that you wrote in the preceding exercise are grammatical?

Where did you place not in these sentences?

Does it always go in the same place?

Could you shift not to another position in these sentences and still have grammatical sentences?

Perhaps a comparison of the symbol strings for the sentences will help you see the answers to these questions more clearly. Your symbol strings should look like this:

1.	NP + pres + be + ing + Vin	NP + pres + be + Neg + ing + Vin
2.	NP + past + M + Vtr + NP^2	NP + past + M + Neg + Vtr + NP
3.	NP + past + have + en + Vtr + NP^2	NP + past + have + Neg + en + Vtr + NP
4.	NP + past + M + Vtr + NP^2	NP + past + M + Neg + Vtr + NP
5.	NP + pres + have + en + Vtr + NP^2	NP + pres + have + Neg + en + Vtr + NP
6.	NP + pres + M + Vin + Loc	NP + pres + M + Neg + Vin + Loc
7.	NP + past + be + ing + Vtr + NP^2	NP + past + be + Neg + ing + Vtr + NP

Where does Neg come in the symbol strings?
What part of the auxiliary does it follow?
Does Neg appear here in any sentences that lack an auxiliary verb?
Does it matter whether the tense is past or present? Which parts of the strings on the left are identical with those on the right?
Which parts are not involved in the addition of Neg?
How can we summarize what these strings reveal about sentences containing Neg?

Sentences 2, 4, and 6 show that
NP + Tns + M + rest of sentence $\Longrightarrow$ NP + Tns + M + Neg + rest of sentence.

According to 3 and 5,
NP + Tns + have + rest of sentence $\Longrightarrow$ NP + Tns + have + Neg + rest of sentence.

In Sentences 1 and 7, be appears as an auxiliary, producing these strings:
NP + Tns + be + rest of sentence $\Longrightarrow$ NP + Tns + be + Neg + rest of sentence.

Or put another way, we can say

1. That not can be added to sentences which contain an M, a be, or a have to produce grammatical negative sentences;
2. That not occupies a fixed position in a sentence, coming into the negative string directly after the M, be, or have; and
3. That the addition of not does not cause any rearrangement of other parts of a sentence because it is simply inserted after M, be, or have.

Written in symbols, a summary of the evidence we have at this point would look like this:

$$\ldots \text{Tns} + \text{M}\ldots \Longrightarrow \ldots \text{Tns} + \text{M} + \text{Neg}\ldots$$

$$\ldots \text{Tns} + \text{be}\ldots \Longrightarrow \ldots \text{Tns} + \text{be} + \text{Neg}\ldots$$

$$\ldots \text{Tns} + \text{have}\ldots \Longrightarrow \ldots \text{Tns} + \text{have} + \text{Neg}\ldots$$

This gives us some conclusions to formulate, in part at least, a rule that accounts for the simple negative.

$$\ldots \left\{ \begin{bmatrix} \text{Tns} + \text{M} \\ \text{Tns} + \text{be} \\ \text{Tns} + \text{have} \end{bmatrix} \right\} \ldots \Longrightarrow \ldots \left\{ \begin{bmatrix} \text{Tns} + \text{M} + \text{not} \\ \text{Tns} + \text{be} + \text{not} \\ \text{Tns} + \text{have} + \text{not} \end{bmatrix} \right\} \ldots$$

Why do we use the symbol . . . before and after the braces? What does the symbol [ ] mean in this rule? Why is such a symbol necessary? Can you think of any other situation in which Tns + M, have, or be, form a group because they behave in the same way in a transformation?

Is this rule adequate to explain all sentences containing not? Thus far we have tested not in sentences containing M, have, or be. What happens when we add not to sentences which have no auxiliary except tense?

Exercise 2:

Try to insert not in these sentences without changing the original sentences in any other way. Then try to construct symbol strings for the pairs of sentences, using the symbol Neg. to stand for not.

Example: The boy broke the window.

NP + past + Vtr + NP $\Longrightarrow$

The boy broke the window

NP + past + Neg + Vtr + NP

The boy ? not break the window.

1. The child became
2. The child was ill
3. The paper cost a quarter
4. Jack picks strawberries reluctantly
5. I am your responsibility
6. The candle glowod dimly in the dark.

Which of the negative sentences that you have constructed are grammatical, and which are not? What kind of verb do the grammatical ones have? What can you conclude about the kind of verb which can become negative simply by the addition of not without the support of M, have, or the auxiliary be? Again we have evidence that the verb Be behaves in a way different from other verbs.

What kinds of verbs do you find in the sentences which became ungrammatical when you added not? (Remember that we are talking about sentences which do not contain M, have, or the auxiliary be.) Look again at sentences 1, 3, 4, and 6. What word would you automatically add with not in these sentences to produce grammatical negatives? In sentences with M, have, or be, the not was placed immediately after the M, have, or be. Where is it placed in sentences 1, 3, 4, and when they become grammatically negative? From this exercise we can see that, whereas the verb Be + not produced a grammatical negative, the other kinds of verbs (Vlnk, Vmid, Vtr, and Vin) require the addition of some form of do when not is added.

A comparison of strings of grammatical negatives with those of nongrammatical negatives, such as Sentence 1, will show clearly why this happens. Study the following sentences.

be + not
1. NP + Tns + be + Neg + ing + go + rest of sentence
Tom is not going

M + not
2. NP + Tns + M + Neg + explain + rest of sentence
The driver could not explain the accident.

have + not
3. NP + Tns + have + Neg + en + make + rest of sentence
I had not made an A in history

Be + not
4. NP + Tns + Be + Neg + rest of sentence
The child is not ill

Whenever be, have, M, or the verb Be is present, Tns has something to attach to. The addition of not doesn't separate tns from the thing it attaches to
(Notice that the string NP + tns + be + Neg is adequate to explain the addition of not to sentences having either the auxiliary be or the verb Be. For economy, then, in this rule, we will let be stand for the verb Be as well as for the auxiliary be.)

Now study the negative strings you constructed for the sentences in Exercise 2 in which there are not M, have, or be. Your strings should look like this: (Remember that for Tns you can write either past or pres.)

1. NP + past + Neg + Vlnk + . . .
*The child ? not become ill.

3. NP + past + Neg + Vmid + . . .
*The paper ? not cost a quarter.

4. NP + pres + Neg + Vtr + . . .
*Jack ? not pick reluctantly.

6. NP + past + Neg + Vin + . . .
*The candle ? not glow + . . .

Notice that when Neg is inserted immediately before the verb, it separates Tns from anything it can attach to. Tns, of course, attaches only to verbs.

Exercise 3:
Now copy the symbol strings above, but insert do between the Tns (past or pres) and Neg. Then show how the strings, with do added, produce grammatical negative sentences for 1, 3, 4, and 6, of Exercise 2.
Example: NP + past + do + Neg + Vtr . . .
The boy did not break the window.

We have already written the part of the negative rule which shows that not can be added immediately after M, have, or be. Now we need to show what happens to sentences which do not have M, have, or be. These will be sentences like 1, 3, 4, and 6 on pp. 4-5. These sentences contained Vlnk, Vmid, Vtr, and Vin. (in other words, every kind but Be.) What is the symbol which includes all types of verbs but Be? We will use this symbol. We have found that in such sentences not is inserted just before the Vrb. With the addition of this information we can symbolize the negative transformation more accurately.

$$\ldots \left\{\begin{matrix}\begin{bmatrix}\text{Tns} + \text{M}\\ \text{Tns} + \text{have}\\ \text{Tns} + \text{be}\end{bmatrix}\\ \\ \text{Tns} + \text{Vrb}\end{matrix}\right\}\ldots \Longrightarrow \ldots \left\{\begin{matrix}\begin{bmatrix}\text{Tns} + \text{M} + \text{not}\\ \text{Tns} + \text{have} + \text{not}\\ \text{Tns} + \text{be} + \text{not}\end{bmatrix}\\ \\ \text{Tns} + \text{not} + \text{Vrb}\end{matrix}\right\}$$

This rule shows, of course, that after the transformation of sentences with only Vrb, Tns will have nothing to attach to. These then require the addition of do.

The do support transformation

Can you remember in what other kind of sentence it is necessary to add do to make a grammatical sentence? In the yes-or- no question transformation what happened when Tns wasn't followed by M, have, or be?

We have found at least two situations in which a transformation separates Tns from the thing it attaches to. And in each case we found that do was then added. We should now be ready to show this in a rule. This transformation is called the $T_{\text{do-support}}$. It is the one which inserts do into questions as well as into negatives. Whenever a transformation separates Tns from anything it can attach to, do must be added. The following rule shows this fact:

$T_{do\text{-}support}$ | Tns $\Longrightarrow$ Tns + do (where Tns is not followed by M, have, be, or Vrb)

Exercise 4:
Write symbol strings for the following sentences. Then put them through the negative transformation. In those sentences which do not have M, have, or be, show the do-support transformation which is necessary to produce a grammatical sentence.

Example: The swallows returned in April.

NP + past + Vin + Tm $\xrightarrow{T_{Neg}}$

The swallows returned in April

NP + past + Neg + Vin + Tm $\xrightarrow{T_{do}}$

NP + past + do + Neg + Vin + Tm

The swallows did not return in April.

1. The rain knocked the flowers to the ground.
2. The team will hold a rally in the gym.
3. Kofax pitched a no-hitter in Minneapolis.
4. Lorna goes to our school this year.
5. The cafeteria serves fish on Friday.

When does a sentence become negative?

Now that we know what happens in a negative transformation, we must ask how we know when to apply it. What is there in the underlying strings of these two sentences

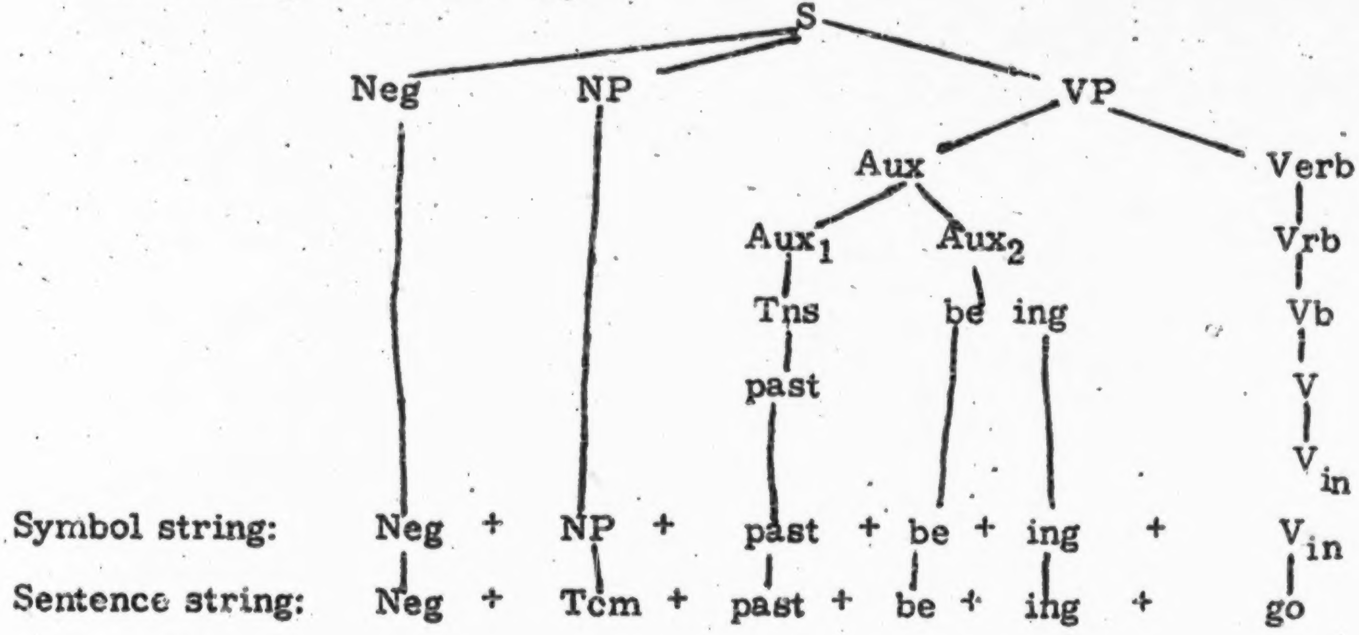
The swallows returned in April.
The swallows did not return in April.

to show that one will become negative and one will not? Remember that we faced the same problem with the question transformation. We decided that in sentences that become questions there was a question element in the underlying structure which triggered the transformation. Why did we add Q to the first Phrase Structure rule? What does it stand for? When we begin to generate a sentence do we have a choice of making it negative or not? We can show this choice by adding the symbol Neg to the first Phrase Structure rule. Since it is an optional element we must put it in parentheses. The new version of Rule 1 will then look like this:

Rule (1) S $\longrightarrow$ (Q) (Neg) NP + VP

This rule tells us that if we select Neg our terminal string will then go through the Negative transformation. The addition of Neg doubles the kinds of sentences we can account for. How many possibilities do you see? If we choose either of the optional elements--or both of them--they will direct us to produce the proper transformation. For example, whenever we produce a negative sentence such as Tom was not going we will produce the same basic symbol string as its corresponding declarative sentence --Tom was going--except that the symbol Neg will appear at the beginning to guarantee that the sentence will go through the negative transformation.

If we wish to diagram a sentence in which Neg is chosen, it will appear in the diagram in this way:



The Neg directs us to put this string through the negative transformation before it can become a sentence. Thus:

$$\text{Neg} + \text{Tom} + \text{past} + \text{be} + \text{ing} + \text{go} \xRightarrow{T_{Neg}}$$

$$\text{Tom} + \text{past} + \text{be} + \text{Neg} + \text{ing} + \text{go}$$

$$\text{Tom} \qquad \text{was} \qquad \text{not} \qquad \text{going}$$

If we have the choice of Neg in our first rule, we can conclude that only strings which contain Neg will go through the transformation and become negative. We should add the symbol, then, to the negative transformation rule. We can summarize all of the information we have discovered in this unit in the Negative rule.

$$T_{neg} \quad \text{Neg} + \text{NP} + \left\{\begin{array}{l}\text{Tns} + \begin{bmatrix}\text{M}\\ \text{have}\\ \text{be}\end{bmatrix}\\ \text{Tns} + \text{Vrb}\end{array}\right\} + \ldots \Longrightarrow$$

$$\text{NP} + \left\{\begin{array}{l}\text{Tns} + \left\{\begin{bmatrix}\text{M}\\ \text{have}\\ \text{be}\end{bmatrix}\right\} + \text{Neg}\\ \text{Tns} + \text{Neg} + \text{Vrb}\end{array}\right\} + \ldots$$

Exercise 5:
Write the underlying symbol strings for the following sentences. Then write the corresponding negative sentence, and show 1) where Neg appears in its symbol string and 2) how Neg produces the negative transformation. Remember that some sentences will require a 3rd transformation, the do-support.

Example:
I am going. (NP + tns + be + ing + Vin)
I am not going. (Neg + NP + tns + be + ing + Vin $\xrightarrow{TNeg}$

NP + tns + be + Neg + ing + Vin
/ / / /
I am not going.

1. The puppy followed the children to school.
2. Many teenagers dunk french fries in catsup.
3. The culprit could explain everything.
4. We saluted the flag during the ceremony.
5. His uniform was spotless.
6. The tornado had destroyed the town.

At the beginning of this unit we explained that we would limit our discussion of Neg to not at this time. However, many other words can produce negative sentences. Even though we will not formalize rules about other negatives at this time, you should be able to draw some conclusions by comparing other negatives with the simple negative which we have been exploring.

An exercise in research:

You may enjoy doing some investigating on your own. See how many other negative words you can list. Put them in sentences to see how they function. For example, can other negatives move around in a sentence? (Remember not occupies a fixed position.) Standard usage does not permit the use of a double negative in a sentence. Do any of the sentences you have written contain two negatives? Does our rule for Neg accommodate a double negative? Should it? Can you detect any pattern in the way other negatives affect English sentences? Perhaps when you have finished some exploration of your own into the problems of the negative you will understand better the necessity for further consideration of the negative in later rules.

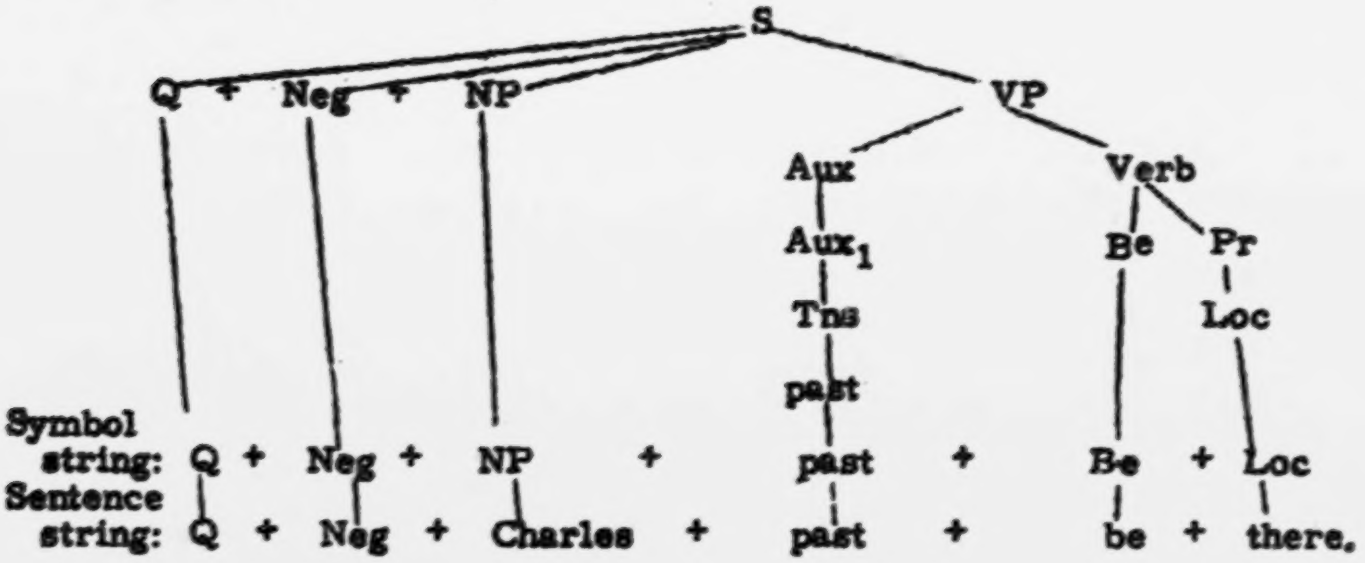
The Negative Question

In Phrase Structure Rule (1) we now have the option of choosing either Neg or Q. We also have an opportunity to choose both. Some of the following are negative. Some are questions. Are there any which are both negative and questions?

1. Did he go?
2. He didn't go.
3. Didn't he go?

4. Wasn't Charles there?
5. I didn't see you.
6. Won't you come to the party?

Those which are both are called negative questions. They result from choosing both Neg and Q in tne first rule. Let's see how sentence #4 was generated. Since it is both negative and a question we know that both Neg and Q were chosen. The diagram would look like this.


S
Q + Neg + NP
VP
Aux
Verb
Aux_1
Be
Pr
Tns
Loc
past
Symbol string: Q + Neg + NP + past + Be + Loc
Sentence string: Q + Neg + Charles + past + be + there.

Our negative transformation tells us that if we have a string like

. . . Neg + NP + past + be . . . it will become . . . NP + past + be + Neg. . .

So our string above will become Q + NP + past + be + Neg + Loc
Charles was not there

The question transformation (T_Q) tells us that if we have

$$Q + NP + Tns + \underline{\begin{bmatrix} M \\ have \\ be \end{bmatrix}} \; . . . \quad \text{it becomes}$$

$$Q + Tns + \underline{\begin{bmatrix} M \\ have \\ be \end{bmatrix}} + NP \; . . . .$$

But it does not tell us what to do if the string contains Neg. How can we change the transformation so that it will change a string like

.Q. + NP + past + be + Neg + Loc
Charles was not there

into a negative question string which will produce Wasn't Charles there?

What element do we find in the string Charles was not there which is not included in our present question transformation rule? If we were to add the element Neg to the rule, then it could operate on strings like the one above. We want it to be able to transform both strings with Neg and those without, so we will make Neg optional. Then it can operate both on negative and on declarative strings. In the transformation of Charles was not there to Wasn't Charles there, does the negative element move ahead of the NP with tns + be or does it stay where it is? We will want to show that it moves with the other elements that move to the front of the sentence. The revised T_Q, then will look like this:

$$T_Q \quad \boxed{\begin{array}{l} \text{Q} + \text{NP} + \text{Tns} + \left\{\begin{array}{c}\begin{bmatrix}\text{M}\\ \text{be}\\ \text{have}\end{bmatrix}\\ \_\_\end{array}\right\} \text{(Neg)} \ldots \Rightarrow \\ \qquad \text{Q} + \text{Tns} + \left\{\begin{array}{c}\begin{bmatrix}\text{M}\\ \text{have}\\ \text{be}\end{bmatrix}\\ \_\_\end{array}\right\} \text{(Neg)} + \text{NP} \ldots \end{array}}$$

This revised rule will enable us to transform

Q + NP + past + be + Neg + Loc
Charles was not there

into

Q + past + be + Neg + NP + Loc
Was not Charles there?

What will this revised T_Q do to a string like

Q + NP + pres + M + go
He can go

which does not contain a negative element?

It will change it to a simple yes-or-no question.

Q + pres + M + NP + go
Can he go?

But if the string does contain a negative, such as

Q + NP + pres + M + Neg + go
He can not go

it will change it to

```
Q + pres + M + Neg + NP + go
      Can      not   he   go
```

Contractions

Most of us would probably not say Was not Charles there? nor Can not he go? What would we say? Wasn't and can't are alternate forms for was not and can not. They are said to be contractions. What does n't stand for? Look at the following pairs of sentences and decide which ones are grammatical.

The milkman did not leave the milk. The milkman didn't leave the milk.	Did not the milkman leave the milk Didn't the milkman leave the milk?
I will not be there. I won't be there.	Will not I be there? Won't I be there?
The cat has not come in. The cat hasn't come in.	Has not the cat come in? Hasn't the cat come in?
The boys should not be so noisy. The boys shouldn't be so noisy.	Should not the boys be so noisy? Shouldn't the boys be so noisy?

What can you conclude about the occurence of n't. The pairs of sentences in the column on the left are simple negatives. The not appears in the verb string after the NP. In such sentences does it seem to matter whether not appears or n't? Apparently it is optional to change the not to n't. The pairs of sentences on the right above are negative questions. The not appears before the NP. In such sentences, what change must take place to make it grammatical? Apparently, when not occurs before an NP it must be changed to n't. In other words it must be made into a contraction.

Therefore, when the question transformation operates on negative sentences to produce sentences like Was not Charles there? and Can not he go? they must become Wasn't Charles there? and Can't he go?

Exercise 6:
Turn each of the following into negatives and then into negative questions.

Example: The leaves are falling fast. ⟹
The leaves are not falling fast. ⟹
Aren't the leaves falling fast?

1. The team was discouraged.
2. The repairmen have been working all summer.
3. The squirrel raced to the treetop.
4. Bill is running for president.
5. The nurse discovered the serum in the icebox.
6. The group will take off in the morning.
7. A bird flew into the attic.

8. **This is John's typewriter.**
9. **The class has counted the errors.**
10. **We have been reviewing the exercises.**

Exercise 7:

Perform the transformations called for by the symbols Q and Neg in the following strings, and then write sentences for the final transformed strings. Remember that some will also require the do-support transformation.

Example:

$$Q + Neg + NP + pres + M + Vtr + NP \xRightarrow{T_{Neg}}$$

$$Q + NP + pres + M + Neg + Vtr + NP \xRightarrow{T_{Q}}$$

$$Q + pres + M + Neg + NP + Vtr + NP$$

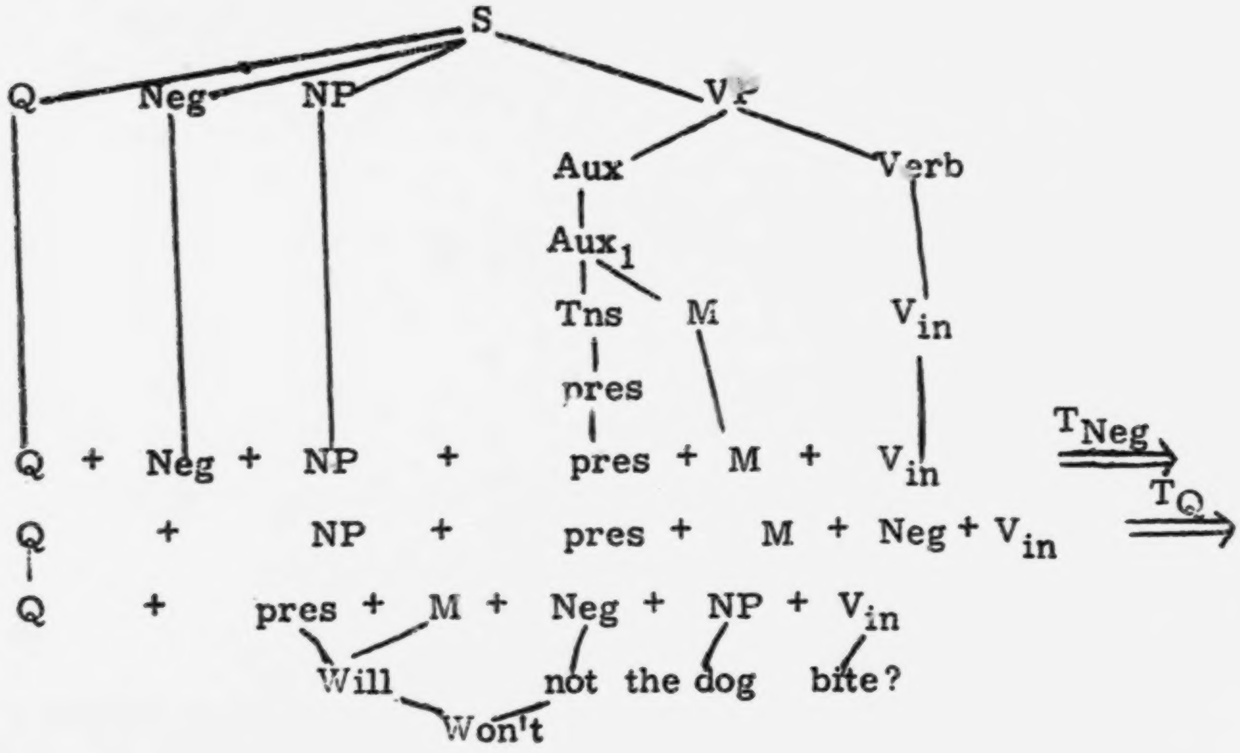
Can't the policeman catch the robber?

1. Q + NP + past + have + en + Vin + Man
2. Q + NP + pres + M + have + en + Vlnk + Adj
3. Q + NP + pres + Be + NP
4. Neg + NP + past + M + Be + Adj
5. Neg + NP + past + be + ing + Vin + Tm
6. Neg + NP + pres + Vmid + NP + Loc
7. Q + Neg + NP + pres + be + ing + Vtr + NP + Man
8. Q + Neg + NP + past + M + have + en + Vlnk + NP
9. Q + Neg + NP + past + have + en + Vtr + NP + Loc
10. Q + Neg + NP + pres + Vt_{dir} + NP + Dir

Exercise 8:

Draw diagrams for the following sentences. If the sentence is a question be sure to include Q in your diagram. If it is negative, be sure to include Neg. If it is a negative question, include both. Then show the transformations the terminal string must go through to produce the final sentence. Simply bring NP down into the string as in the example.

Example: **Won't the dog bite?**


S
Q
Neg
NP
VP
Aux
Verb
Aux₁
Tns
M
V in
pres
Q + Neg + NP + pres + M + V in
T Neg
Q + NP + pres + M + Neg + V in
T Q
Q + pres + M + Neg + NP + V in
Will
not the dog bite?
Won't

1. Is the teacher staying here?
2. Has the bus left?
3. The bus hasn't left.
4. Hasn't the bus left?
5. Can't the pointer find the bird?